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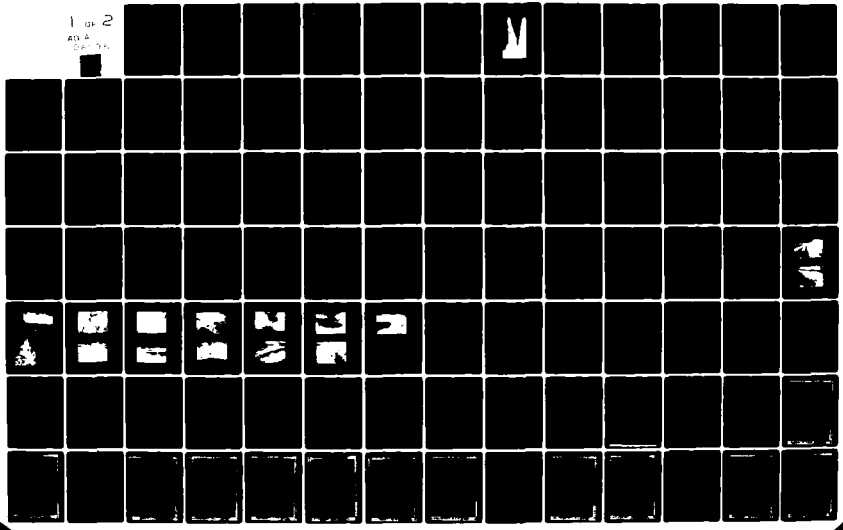

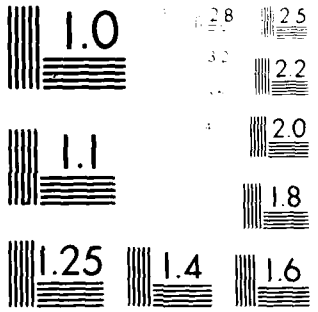

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PERRY CITY DAM

RALLS COUNTY, MISSOURI

MO 10675

PHASE I INSPECTION REPORT
NATIONAL DAM SAFETY PROGRAM

PREPARED BY: U. S. ARMY ENGINEER DISTRICT, ST. LOUIS

FOR: STATE OF MISSOURI

JANUARY 1979

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SECURITY CLASSIFICATION OF THIS PAGE (When Data Entered)

REPORT DOCUMENTATION PAGE

READ INSTRUCTIONS BEFORE COMPLETING FORM

1. REPORT NUMBER

2. GOVT ACCESSION NO. AD-A106595

3. RECIPIENT'S CATALOG NUMBER

4. TITLE (and Subtitle)
Phase I Dam Inspection Report
National Dam Safety Program
Perry City Dam - Lower (MO 10675)
Ralls County, Missouri

5. TYPE OF REPORT & PERIOD COVERED
Final Report

6. PERFORMING ORG. REPORT NUMBER

7. AUTHOR(s)
Consoer, Townsend and Associates, Ltd.

8. CONTRACT OR GRANT NUMBER(s)
DACW43-78-C-0160

9. PERFORMING ORGANIZATION NAME AND ADDRESS
U.S. Army Engineer District, St. Louis
Dam Inventory and Inspection Section, LMSED-PD
210 Tucker Blvd., North, St. Louis, Mo. 63101

10. PROGRAM ELEMENT, PROJECT, TASK AREA & WORK UNIT NUMBERS

11. CONTROLLING OFFICE NAME AND ADDRESS
U.S. Army Engineer District, St. Louis
Dam Inventory and Inspection Section, LMSED-PD
210 Tucker Blvd., North, St. Louis, Mo. 63101

12. REPORT DATE
January 1979

13. NUMBER OF PAGES
Approximately 100

14. MONITORING AGENCY NAME & ADDRESS (if different from Controlling Office)
Walter G. Shiffrin

15. SECURITY CLASS. (of this report)
UNCLASSIFIED

15a. DECLASSIFICATION/DOWNGRADING SCHEDULE

16. DISTRIBUTION STATEMENT (of this Report)
Approved for release; distribution unlimited.

17. DISTRIBUTION STATEMENT (of the abstract entered in Block 20, if different from Report)

18. SUPPLEMENTARY NOTES
National Dam Safety Program. Perry City Dam (MO 10675), Mississippi - Salt - Quincy River Basin, Ralls County, Missouri. Phase I Inspection Report.

19. KEY WORDS (Continue on reverse side if necessary and identify by block number)
Dam Safety, Lake, Dam Inspection, Private Dams

20. ABSTRACT (Continue on reverse side if necessary and identify by block number)
This report was prepared under the National Program of Inspection of Non-Federal Dams. This report assesses the general condition of the dam with respect to safety, based on available data and on visual inspection, to determine if the dam poses hazards to human life or property.

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SECURITY CLASSIFICATION OF THIS PAGE (When Data Entered)

DEPARTMENT OF THE ARMY
ST. LOUIS DISTRICT, CORPS OF ENGINEERS
210 NORTH 12TH STREET
ST. LOUIS, MISSOURI 63101

IN REPLY REFER TO

SUBJECT: Perry City Dam (Mo. 10675),
Phase I Inspection Report

This report presents the results of field inspection and evaluation of Perry City Dam (Mo. 10675). It was prepared under the National Program of Inspection of Non-Federal Dams.

SUBMITTED BY: SIGNED — Chief, Engineering Division — 28 FEB 1979 (Date)

APPROVED BY: SIGNED — Colonel, CE, District Engineer — 28 FEB 1979 (Date)

PHASE I INSPECTION REPORT
NATIONAL DAM SAFETY PROGRAM

Name of Dam:	Perry City Dam, Missouri Inv. No. 10675
State Located:	Missouri
County Located:	Ralls
Stream:	Mace Branch of Lick Creek
Date of Inspection:	September 30, 1978

Assessment of General Condition

Perry City Dam No. Mo. 10675 was inspected using the "Recommended Guidelines for Safety Inspection of Dams". These guidelines were developed by the Chief of Engineers, U.S. Army, Washington, D.C., with the help of Federal and State agencies, professional engineering organizations, and private engineers. The resulting guidelines are considered to represent a consensus of the engineering profession.

Based on the criteria set forth in the guidelines, the dam is in the high hazard potential classification, which means that loss of life and appreciable property loss could occur in the event of failure of the dam. Two to three houses, one State road and two County roads would be subject to flooding, with possible damage and/or destruction, and possible loss of life. Perry City Dam is in the small size classification since it is less than 40 feet high and impounds less than 1,000 acre-feet of water.

Our inspection and evaluation indicates that the spillway of Perry City Dam does not meet the criteria set forth in the guidelines for a dam having the above size and hazard potential. Perry City Dam is a small size dam with a high hazard potentital required by the guidelines to pass from one-half Probable Maximum Flood to the Probable Maximum Flood without overtopping. Since there is significant hazard potential downstream of the dam, the appropriate Spillway Design Flood (SDF) for this dam is the Probable Maximum Flood. It was determined that the spillway will pass 41 percent of the Probable Maximum Flood without overtopping the dam. Our evaluation indicates that the spillway will pass the 100-year flood; that is, a flood having a 1 percent chance of being equalled or exceeded during any given year.

The Probable Maximum Flood is defined as the flood discharge that may be expected from the most severe combination of critical meteorological and hydrologic conditions that are resonably possible in the region.

Other deficiencies noted by the inspection team were a need for a periodic inspection by a qualified professional engineer; lack of a maintenance schedule; a need for additional protection for the upstream embankment slope; deteriorated concrete in the concrete spillway structure; a need for a Phase I inspection of the upstream dam; and vegetative growth in the discharge channel for the low level outlet. The lack of stability and seepage analyses on record is also a deficiency that should be corrected.

It is recommended that the owner take action to correct or control the deficiencies described above.

Walter G. Shifrin, P.E.

PERRY CITY DAM

PHASE I INSPECTION REPORT
NATIONAL DAM SAFETY PROGRAM

Perry City Dam, I.D. No. 10675

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PHASE I INSPECTION REPORT
NATIONAL DAM SAFETY PROGRAM

PERRY CITY DAM, Missouri Inv. No. 10675

SECTION 1: PROJECT INFORMATION

1.1 General

a. Authority

The Dam Inspection Act, Public Law 92-367 of August, 1972, authorizes the Secretary of the Army, through the Corps of Engineers, to initiate a national program of dam inspections. Inspection for the Perry City Dam was carried out under Contract DACW 43-78-C-0160 to the Department of the Army, St. Louis District, Corps of Engineers, by the engineering firms of Consoer, Townsend & Associates Ltd., and Engineering Consultants, Inc. (A Joint Venture), of St. Louis, Missouri.

b. Purpose of Inspection

The visual inspection of the Perry City Dam was made on September 30, 1978. The purpose of the inspection was to make a general assessment as to the structural integrity and operational adequacy of the dam embankment and its appurtenant structures.

c. Scope of Report

This report summarizes available pertinent data relating to the project; presents a summary of visual observations made during the field inspection; presents an evaluation of hydrologic and hydraulic conditions at the site; presents an evaluation as to the structural adequacy of the various project features; and assesses the general condition of the dam with respect to safety.

It should be noted that reference in this report to left or right abutments is as viewed looking downstream. Where left abutment or left side of the dam is used in this report, this also refers to south abutment or side, and right to the north abutment or side.

d. Evaluation Criteria

Criteria used to evaluate the dam were furnished by the Department of the Army, Office of the Chief of Engineers, in "Recommended Guidelines for Safety Inspection of Dams", Appendix D. These guidelines were developed with the help of several Federal agencies and many state agencies, professional engineering organizations, and private engineers.

1.2 Description of the Project

a. Description of Dam and Appurtenances

No drawings which satisfactorily portray the embankment section were found. The following description is based on available drawings and field observations made during the visual inspection.

The dam embankment is a homogeneous earthfill structure. The crest of the embankment generally has a width of 20 feet and a length of approximately 800 feet. The crest elevation is set at 683.0 feet above MSL, and the maximum height of the embankment is 26 feet above the minimum streambed elevation along the centerline of the dam.

The upstream face of the embankment is nearly vertical for the top 7 to 8 feet. This face has a 4 foot high vertical man-made wall consisting of various sized limestone blocks and old concrete for protection of the embankment material. The wall has a top elevation at approximately 679.0, and extends down to a base elevation of 675.0. Below elevation 675.0, the embankment section has a slope of 1V to 2H to the ground surface.

The downstream embankment slope has a slope of 1V to 2-1/2H for the top 5 vertical feet, an 8-foot nearly horizontal berm, and a 1H to 2V slope from the berm to the ground surface. The slope is protected by a vegetative cover.

The drawings made in 1935 show an 8-foot high by 5-inch thick concrete cut-off wall placed to a depth of 6 feet into the alluvium and to bedrock. The wall is located along the centerline of the dam embankment constructed at that time.

The cut-off wall was to extend from station 4+70 to station 5+70. A core trench of compacted clay with a bottom width of 8 to 10 feet and 1V to 1H side slope is also shown to have been constructed for an average depth of 2 feet into the alluvium. This trench was to extend from station 5+10 to station 7+20.

Bedrock at the site and within the vicinity is composed of limestones of Mississippian age. The gently rolling hills adjacent to the site are mantled by residual clay and glacial soils, a weathered product of the bedrock. Alluvial deposits are encountered along the stream courses of the area.

No rock crops out over the site, however, the excavation for the spillway discharge channel has exposed limestone at the channel bottom. Available drawings show a layer of coarse gravel and clay of varying thickness to exist in the alluvium, underlain by the limestone bedrock.

There are two spillways for the Perry City reservoir. The service spillway is located at the left abutment just beyond the end of the embankment. This spillway consists of an uncontrolled concrete weir crest section, a sloping concrete chute channel which drops to a sloping concrete apron, and an unlined stilling pond which is immediately downstream from the concrete apron. The spillway crest has a net length of 50 feet and a crest width of 9 inches. There is a 4 foot drop between the spillway crest and the beginning of the spillway chute, and a 2 foot drop between the end of the spillway chute and the sloping concrete apron. The net width of the spillway chute reduces from 50 feet at the spillway crest to 38 feet at the exit. The spillway crest is at elevation 676.4 feet MSL.

The emergency spillway is a grass lined open channel which is located at approximately 70 feet to the left of the service spillway. This spillway is an excavated section in a natural depression. The cross section of the spillway channel is trapezoidal with bottom width of 80 feet and side slopes of 1V to 3H on the left side and 1V to 2H on the right side. The spillway control section is at elevation 678.5 feet MSL. The exit channel of the emergency spillway joins the service spillway channel downstream of the dam prior to entering the natural downstream channel for the streambed.

An intake tower in the reservoir contains three 4 inch gate valves for admitting water to the tower from different levels in the reservoir, as well as an outlet for the suction line connected to the pumps in the water treatment plant. The tower is constructed of concrete; its interior measures 3 feet square in plan by 16 feet in depth.

A fourth 4-inch gate valve in the tower is the control for a 4-inch bottom outlet pipe drain which connects into a 10-inch cast iron pipe which was laid under the embankment to serve as a diversion pipe during construction.

The design data indicates that in 1965, the 10-inch pipe drain was lengthened downstream during raising of the embankment, and a length of 12 concrete pipe was added to extend the drain to the watercourse below the dam.

The operating stems for all the valves extend upward to the top of the tower where they are fitted with T-handles. The tower has no top deck, and it is accessible only by boat.

The reservoir at Perry City Dam impounds approximately 61 acre-feet of water from a drainage area of 2.47 square miles. Most of the reservoir inflow is controlled by the upstream reservoir, the New Perry City Dam, which is located immediately upstream from Perry City Dam. The New Perry City Dam is also an earthfill embankment dam which has both a service spillway and emergency spillway. The embankment length is approximately 680 feet with the service spillway at the right abutment and emergency spillway at the left abutment. Both spillways discharge into the Perry City reservoir. Safety inspection of the upstream dam is, of course, not part of the present study.

b. Location

The Perry City Dam is located on the Mace Branch of Lick Creek, Ralls County, Missouri. The nearest community downstream of the lake is Perry itself, with a population of 839. The dam and reservoir are shown on Perry Quadrangle Sheet (7.5 minute series) in Section 34, Township 54 North, Range 7 West.

c. Size Classification

According to the "Recommended Guidelines for Safety Inspection of Dams", by the U.S. Department of the Army, Office of the Chief Engineer, the dam is classified in the dam size category as being "Small" since its storage is less than 1,000 acre-feet. The dam is also classified as "Small" in dam height category because its height is less than 40 feet. The overall size classification is, accordingly, "Small" in size.

d. Hazard Classification

The dam has been classified as having "High" hazard potential in the National Inventory of Dams, on the basis that in the event of failure of the dam or its appurtenances, excessive damage could occur to downstream property, together with the possibility of the loss of life. Our findings concur with the classification. The estimated damage zone extends 1.5 miles downstream of the dam. Within the damage zone are two to three houses, one state road and two county roads.

e. Ownership

Perry City Dam is owned by the city of Perry, Ralls County, Missouri.

f. *Purpose of Dam*

The purpose of the dam is to impound water for use in a water supply system operated by the city of Perry.

g. Design and Construction History

Perry City Dam was originally designed and constructed in 1935. The design engineers at that time were W. B. Rollins and Company of Kansas City, Missouri.

The location of the original dam was at an embankment constructed in 1871 as a railroad dump. The embankment constructed in 1935 spanned across adjacent toes of the railroad dump. The embankment had a crest width of 6 feet at elevation 679.5, and side slopes of 1V to 2H upstream and 1V to 1-1/2H downstream. The concrete spillway was con-

structed at that time, as well as the treatment plant and pump station used for the city of Perry's water supply.

In 1964, H. W. Thomas and Frank Beard, Associate Engineers, designed major improvements to the water supply storage system. These improvements included raising the existing embankment 3.5 feet, the spillway 2 feet, and construction of a smaller reservoir upstream of the old reservoir. An emergency spillway at the left abutment was also constructed at that time, as well as dredging of the reservoir area. No construction has been done at the damsite since 1964.

h. Normal Operational Procedures

The dam is used to impound water for use as water supply for the city of Perry, Missouri. The reservoir level is controlled by rainfall, runoff, evaporation, water supply requirements of the city of Perry, Missouri, and inflow from the reservoir located directly upstream of reservoir. The reservoir is nearly full at all times.

1.3 Pertinent Data

a. Drainage Area (acres)	1,583
b. Discharge at Damsite	
Estimated experienced maximum flood (cfs):	1,400
Estimated ungated spillway capacity at maximum pool elevation (both spillways - cfs):	5,400

c. Elevation (Feet above MSL)

Top of dam:	683.0
Spillway crest:	
Emergency Spillway	680.0
Service Spillway	676.4
Minimum streambed elevation at centerline of dam:	657.0
Maximum tailwater:	Unknown

d. Reservoir

Length of maximum pool (feet):	1,200

e. Storage (Acre-Feet)

Top of dam (based on available drawings):	191
Spillway crest (based on available drawings):	61

f. Reservoir Surface (Acres)

Top of dam:	24
Spillway crest (Service Spillway):	16

g. Dam

Type:	Homogeneous Earthfill
Length:	800 feet
Height (maximum):	26 feet
Top width:	20 feet
Side slopes:	
Downstream	1V to 2-1/2H for top 5 feet, 8 foot berm, and 1V to 2H to ground surface
Upstream	Vertical for top 8 feet and 1V to 2H to ground surface
Zoning:	None

Impervious core:	None
Cutoff (see paragraph 1.2a):	8 foot high concrete wall and 8 to 10 foot bottom width core trench with 1V to 1H side slopes
Grout curtain:	None

h. Diversion and Regulating Tunnel None

i. Spillway

Type:	Uncontrolled
Length of weir:	
Service Spillway	50 feet
Emergency Spillway	80 feet
Crest Elevation (feet above MSL):	
Service Spillway	676.4
Emergency Spillway	678.5

j. Regulating Outlets (see paragraph 2.1a)

Type:	4-inch diameter cast iron pipe to 10 inch diameter cast iron pipe to 12 inch diameter reinforced concrete pipe
Length:	4 inch = 45 feet 10 inch = 150 feet 12 inch = 100 feet
Closure:	Gate valve at upstream end
Maximum Capacity:	1.5 cfs

SECTION 2: ENGINEERING DATA

2.1 Design

Original design drawings made in 1935 are available for the dam and appurtenant structures. Also, several reconstruction drawings made in 1964 are availabe. These drawings are available from the Water Superintendent for the City of Perry, Missouri, and are also included in this report. No other design data is available.

2.2 Construction

No data other than the construction history given in Section 1.2g is available.

2.3 Operation

No operation records are available for Perry City Dam.

2.4 Evaluation

a. Availability

The only engineering data available is the design drawings described above. No design computations, construction data or operation data is available.

In addition, no pertinent data was available for review of hydrology spillway capacity, flood routing through the reservoir, outlet capacity, slope stability, seepage analysis, or foundation conditions.

b. Adequacy

The design drawings are adequate to aid in evaluating the hydraulic and hydrologic capabilities and stability of the dam for Phase I investigations.

The lack of engineering data other than limited design drawings did not allow for a definitive review and evaluation. Therefore, the adequacy of this dam could not be assessed from the standpoint of reviewing and evaluating design, operation and construction data, but is based primarily on visual inspection, past performance history, and sound engineering judgment.

Seepage and stability analyses comparable to the requirements of the "Recommended Guidelines for Safety Inspection of Dams" were not available, which is considered a deficiency. These seepage and stability analyses should be performed for appropriate loading conditions (including earthquake loads) and made a matter of record.

c. Validity

The dam and appurtenant structures appears to have been constructed in accordance with the available design drawings. However, the available drawings are incomplete, and do not portray existing conditions adequately.

SECTION 3: VISUAL INSPECTION

3.1 Findings

a. General

A visual inspection of Perry City Dam was made on September 30, 1978. The following persons were present during the inspection:

Name	Affiliation	Disciplines
Yin Au-Yeung	Engineering Consultants, Inc.	Project Engineer, Hydraulics and Hydrology
David Bramwell	Engineering Consultants, Inc.	Geology
Jon Diebel	Engineering Consultants, Inc.	Soils
John Ismert	Engineering Consultants, Inc.	Mechanical
Kevin Blume	Consoer, Townsend & Assoc., Ltd.	Civil & Structural

Specific observations are discussed below.

b. Dam

The crest of the embankment is in satisfactory condition. The width was found to vary from 20 feet for the majority of the dam to 40 feet near the concrete spillway.

The downstream embankment slope is well protected by vegetative cover. Many longitudinal and vertical cracks were observed on the downstream slope. These cracks were as wide as 1/2 inch in some places. Inspection of areas adjacent to the reservoir revealed similar cracking, indicating it is

likely a property of the material used for the embankment. The embankment material that could be reached was found to be a low to medium plastic clay with some sand and gravel up to 1 inch in diameter. The material would be classified as CL by the Unified Soil Classification System.

The block wall protecting the upstream slope is unstable in many areas. The wall appears to be settling due to its weight, causing the instabililty. Some voids were apparent behind the wall due to either rodent activity or the fine-grained material being pulled through the rocks in the wall. Sloughing is occurring above the wall due to the steep upstream slope.

c. Appurtenant Structures

(1) Service Spillway

Concrete in the entire spillway structure is in a deteriorated condition. The 9-inch concrete weir was built on the old and damaged original crest structure. Several major cracks on the chute floor and vertical walls were observed. No seepage was visible in the area of the concrete spillway chute, however, severe erosion was observed at the end of the spillway chute and the concrete apron as a result of the past heavy storms. Exposed reinforcement was noticed at the end of the spillway chute, as shown in Photos 12 and 13 in Appendix A. The entire concrete apron at the end of the spillway chute was undercut. Photo 10 shows the deteriorated condition in the spillway concrete.

(2) Emergency Spillway

In contrast to the condition of the service spillway, the emergency spillway is well-defined, reasonably maintained, and is in adequate condition.

(3) Outlet Works

Inspection from a boat was made of the top of the tower. One of the Water Works Department staff attempted a trial operation of the valves, but was unable to operate them because the boat afforded insufficient leverage to turn the short T-handles connected to the stems. The downstream outlet of the 12-inch concrete drain pipe was located and found to be submerged. A 3-foot wide by 25-foot long ditch connecting the outlet to the watercourse was choked with heavy grass and a few small bushes. The concrete visible at the top of the gate tower was old, but in acceptable condition.

d. Reservoir Area

The water level in the reservoir was about 18 inches below the service spillway crest. No indication of instability or severe erosion along the rim was apparent. Since the New Perry City Dam is located at the upstream edge of the Perry City Dam, possibility of heavy wave wash on the embankment is very remote.

e. Downstream Channel

The downstream channel immediately downstream from the service spillway chute floor is in poor condition, as evident in Photo 14. Severe erosion on the left bank of the channel were observed.

3.2 Evaluation

The following deficiencies were observed which could affect the safety of the dam, or which will require maintenance within a reasonable period of time.

1. The unstable wall protecting the upstream embankment slope, and the embankment sloughing above the wall.

2. The choked discharge channel for the low level outlet, allowing submergence of the pipe invert.

3. The deteriorated condition of the concrete spillway structure.

4. The unstable left bank of the service spillway discharge channel.

SECTION 4: OPERATIONAL PROCEDURES

4.1 Procedures

The Perry City Dam impounds water for use as water supply for the city of Perry, Missouri. The 3-foot square intake tower contains three 4-inch gate valves located at different levels, along with the intake suction line connected to the pumps in the water treatment plant. Each valve has an operating stem fitted with a T-shaped handle which extends to the top of the tower. The concrete tower is also equipped with a 4-inch bottom outlet pipe which connects into a 10-inch cast iron pipe laid under the embankment which originally served as a diversion pipe during construction. Water levels are checked daily at Perry Lake.

4.2 Maintenance of Dam

The dam and related structures are maintained by the water superintendent of Perry, Missouri. Items observed at the dam requiring maintenance include stabilization of the upstream embankment slope, repairs to the concrete spillway section. and clearing of the choked outlet works discharge channel. Also, severe erosion was observed on the south bank of the downstream channel for the service spillway. The downstream slope and crest seem to be well maintained and free of trees and brush.

4.3 Maintenance of Operating Facilities

Since there is no routine need for operating the low level drain valve, a standard operating procedure for reservoir drawdown has not been developed. The facilities at the pump house and upper reservoir are maintained by the water superintendent on a daily basis.

4.4 Description of Any Warning System in Effect

The inspection team is not aware of any existing warning system in effect.

4.5 Evaluation

The operation and maintenance at the damsite seem to be satisfactory. The water treatment plant and reservoir are basically designed to operate by themselves. The items mentioned in Section 4.2 should receive attention within a reasonable period of time. In addition, all valves in the intake tower should be tested to insure that they operate satisfactorily.

SECTION 5: HYDRAULIC/HYDROLOGIC

5.1 Evaluation of Features

a. Design

No hydraulic design data are available.

Perry City Lake has a watershed of approximately 1,583 acres. Watershed area below the New Perry City Dam on the upstream, and the Perry City Dam investigated in this report is about 78 acres. Land gradients in the watershed average roughly 2 percent. The lake is located on Mace Branch of Lick Creek. The New Perry City Dam is located on the upstream reservoir edge of the Perry City Dam. Most of the inflow into the Perry City reservoir is though the upstream reservoir.

Elevations within the watershed range from approximately 650 feet above MSL at the damsite to over 735 feet above MSL in the upper portion of the watershed.

The watershed is approximately 98 percent covered by grass, brush and farmland, with the remainder being covered by light forest. A drainage map showing the watershed area is included in Appendix B.

Evaluation of the hydraulic and hydrologic features of Perry City Dam was based on criteria set forth in the Corps of Engineers' Recommended Guidelines for Safety Inspection of Dams, and additional guidance provided by the St. Louis District of the Corps of Engineers. The Probable Maximum

Flood (PMF) was calculated from the Probable Maximum Precipitation (PMP) using the methods outlined in the U.S. Weather Bureau Publication, Hydrometerological Report No. 33. The probable maximum storm duration was set at 24 hours, and storm rainfall distribution was based on criteria given in EM 1110-2-1411 (Standard Project Storm). The SCS triangular hydrograph, transformed to a curvilinear hydrograph, was adopted for developing the unit hydrograph. Two unit hydrographs were calcultated. One unit hydrograph was for drainage area above the upstream dam; another unit hydrograph was for drainage area below the upstream dam to Perry City Dam. The derived unit hydrographs are presented in Appendix B.

Initial and infiltration loss rates were applied to the PMP to obtain rainfall excesses. The rainfall excesses were then applied to the unit hydrograph to obtain the PMF hydrograph, utilizing the Corps of Engineers' computer program HEC-1 (Dam Safety Version), which was prepared specifically for dam safety analysis. The computed peak discharge of the PMF and one-half of the PMF at the upstream reservoir are 13,521 cfs and 6,721 cfs. The peak discharge of the PMF and one-half of the PMF between the upstream dam and Perry City Dam are 1,599 cfs and 789 cfs, respectively.

Both the PMF and one-half of the PMF inflow hydrographs at the upstream dam were routed through the upstream reservoir by the Modified Puls Method, also utilizing the HEC-1 (Dam Safety Version) computer program. The peak outflow discharges for the PMF and one-half of the PMF at the upstream spillways are 13,349 cfs and 6,713 cfs, respectively. These outflow hydrographs were combined with the PMF and one-half of the PMF for the Perry City Dam. The combined hydrographs for both the PMF and one-half of the PMF, were then routed through the Perry City reservoir. The peak

outflow discharges for the PMF and one-half of the PMF at Perry City dam are 13,505 cfs and 6,627 cfs respectively. Both the PMF and one-half of the PMF, when routed through the reservoir resulted in overtopping of the dam.

The stage-outflow relation for the spillways were prepared from field notes, sketches and limited design drawings. The reservoir stage-capacity data were based on the U.S.G.S. quadrangle topographic maps in combination with data given in the National Dam Safety Inventory Table. Reservoir storage capacity included surcharge levels exceeding the top of the dam, and the spillway rating curves assumed that the dam remains intact during routing. The spillway rating curves and the reservoir capacity curve are also presented in Appendix B.

From the standpoint of dam safety, the hydrologic design of a dam aims at avoiding overtopping. Overtopping is especially dangerous for an earth dam because the downrush of waters over the crest will erode the dam face and, if continued long enough, will breach the dam embankment and release all the stored waters suddenly into the downstream floodplain. The safe hydrologic design of a dam calls for a spillway discharge capability in combination with an embankment crest height that can handle a very large and exceedingly rare flood without overtopping.

b. Experience Data

No records of reservoir stage or spillway discharge are maintained for this site. However, according to interviews with the owner representative, the maximum reservoir level was never higher than the crest of the embankment.

c. Visual Observations

Concrete in the service spillway structure is in poor condition.

The exit channel for both the service spillway and the emergency spillway are located at the furthermost left abutment. Channel banks of the service spillway exit channel are not stable, and exhibit extensive sloughing and erosion.

d. Overtopping Potential

As indicated in Section 5.1-a., both the Probable Maximum Flood and one-half of the Probable Maximum Flood, when routed through the reservoir, resulted in overtopping of the dam. The PMF and one-half of the PMF overtopped the dam crest by 1.59 feet and 0.38 feet, respectively. The total duration of embankment overflow is 2.67 hours during the PMF, and 0.67 hours during one-half of the PMF. The spillway of the Perry City Dam is capable of passing a flood equal to approximately 41 percent of the PMF just before overtopping of the dam. The 41 percent PMF has a frequency occurrence less than a 100-year frequency flood. Since the PMF is the Spillway Design Flood (SDF) for Perry City Dam, according to the Recommended Guidelines for Safety Inspection of Dams by the Corps, the spillway capacity of the dam is considered "Seriously Inadequate".

The effect from rupture of the dam could extend approximately 1.5 miles downstream of the dam. There are two to three houses, one state road, and two county roads within this 1.5 miles of floodplain area.

SECTION 6: STRUCTURAL STABILITY

6.1 Evaluation of Structural Stability

a. Visual Observations

There were no signs of settlement or distress observed on the embankment or foundation during the visual inspection, outside of the upstream embankment slope. The rock wall protecting the upstream slope embankment material was unstable and had failed in many areas. Sloughing was prevalent where the wall was not satisfactorily protecting the slope, due to the steepness of the slope.

Visual observations of the spillways which adversely affect the structural stability of this dam are discussed in Section 3, Paragraph 3.1, and Section 5, Paragraph 5.1.c. The unstable bank of the service spillway discharge channel does not adversely affect the structural stability of the embankment. However, the owner may desire to stabilize this bank to prevent continued erosion and sloughing.

No problems were observed with the low level outlet, which would jeopardize the safety of the dam. However, the discharge channel for the outlet should be cleared, in case drainage of the reservoir becomes necessary for any reason.

b. Design and Construction Data

No design or construction data relating to the structural stability of the dam or appurtenant structures were found.

c. Operating Records

No operating records are available relating to the stability of the dam or appurtenant structures. Water levels have not been recorded, however, water was only 18 inches below the crest on the day of inspection, and is assumed to be close to full at all times.

d. Post Construction Changes

Post construction changes which affect the structural stability of the dam are given in Section 1.2g.

e. Seismic Stability

In general projects located in Seismic Zones 0, 1 and 2 can be assumed to present no hazard from earthquake, provided the static stability conditions are satisfactory and conventional safety margins exist. Perry City Dam is located in Seismic Zone 1. A detailed seismic analysis is not felt to be necessary for this embankment.

SECTION 7: ASSESSMENT/REMEDIAL MEASURES

7.1 Dam Assessment

The assessment of the general condition of the dam is based upon available data and visual inspections. Detailed investigations, testing, and detailed computational evaluations are beyond the scope of a Phase I investigation; however, the investigation is intended to identify any need for such studies.

It should be realized that the reported condition of the dam is based on observations of field conditions at the time of inspection along with data available to the inspection team.

It is also important to note that the condition of a dam depends on numerous and constantly changing internal and external conditions, and is evolutionary in nature. It would be incorrect to assume that the present condition of the dam will continue to represent the condition of the dam at some point in the future. Only through continued care and inspection can there be any chance that an unsafe condition could be detected.

a. Safety

The spillway capacity of Perry City Dam was found to be seriously inadequate. The spillway will safely pass 41 percent of the PMF without overtopping, which has a frequency occurrence less than a one percent chance flood.

The condition of the upstream embankment slope protection should be improved. Adequate erosion protection should be provided to protect the embankment material.

If concrete spillway is left in place, the deteriorated concrete should be repaired.

It is recommended that a Phase I inspection be performed for the dam and reservoir immediately upstream of Perry City Dam. The safety of the dam discussed in this report is dependent upon the safety of the upstream dam. The subsequent report from the recommended inspection should be incorporated with this report.

b. Adequacy of Information

Information concerning operation and maintenance of the dam and appurtenant structures is somewhat lacking. It is recommended that the following programs be initiated to help alleviate this problem:

1. Periodic inspection of the dam by a professional engineer experienced in the design and construction of earthen dams should be made and this inspection report made a matter of record.

2. Set up a mantenance schedule and log all visits to the dam for operation, repairs and maintenance.

3. Seepage and stability analyses comparable to the requirements of the "Recommended Guidelines for Safety Inspection of Dams".

c. Urgency

The remedial measures recommended in Paragraph 7.2 should be accomplished in the near future.

Increasing the spillway capacity and repairing the spillway structure is of a more urgent nature than the other recommended actions.

d. Necessity for Phase II Inspection

Based on results of the Phase I inspection, a Phase II inspection is not felt to be necessary.

7.2 Remedial Measures

1. Spillway size and/or height of dam should be increased to pass the PMF.

2. Improve the condition of the upstream embankment slope protection.

3. Make extensive repairs to the concrete spillway structure.

4. Perform a Phase I inspection on the dam upstream of Perry City Dam (No. 10675), and incorporate the subsequent report with this report.

5. O & M Maintenance Procedures

The owner should initiate the following programs:

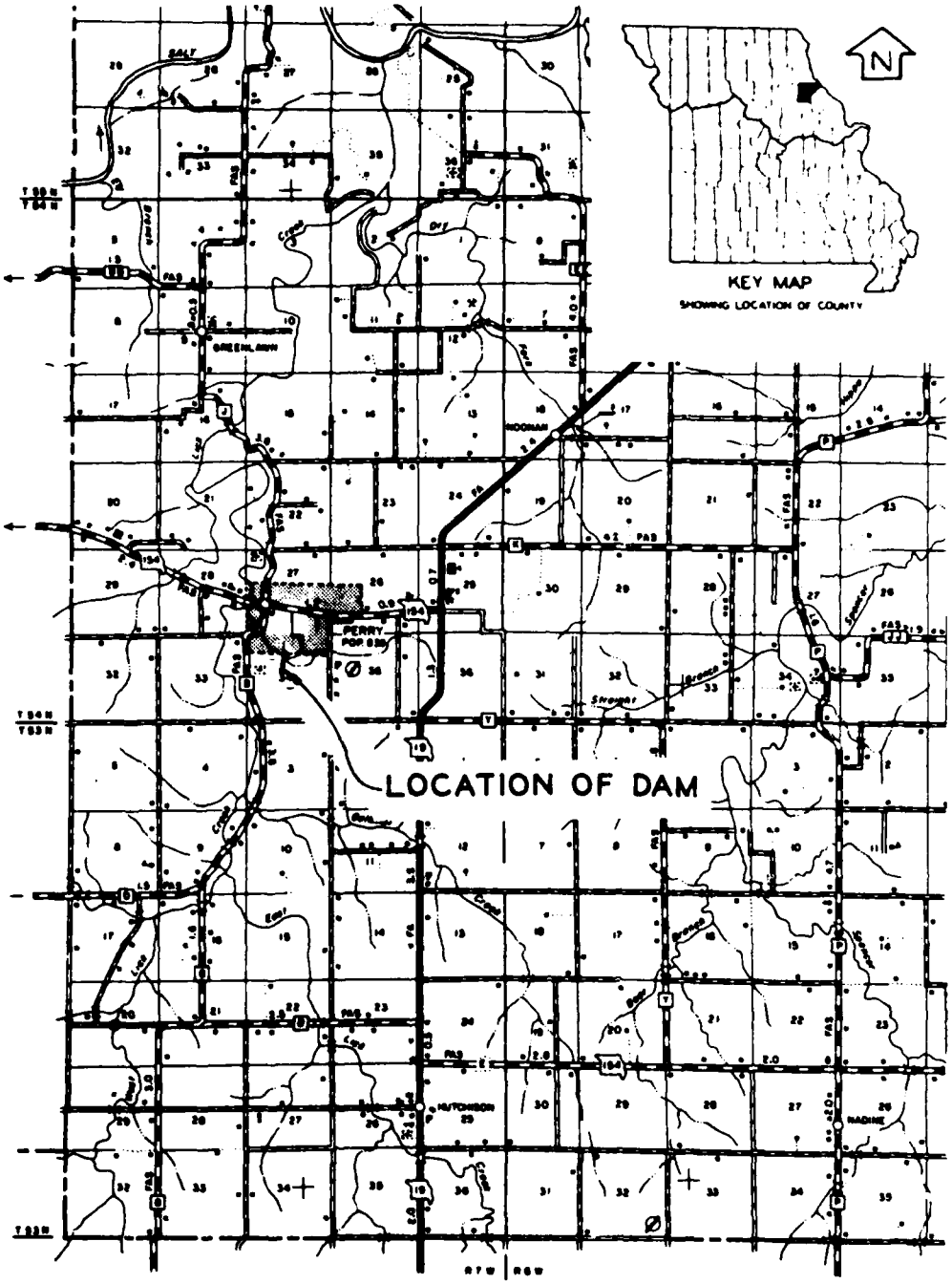
(a) Periodic inspection of the dam by a professional engineer experienced in the design and construction of earthen dams.

(b) Set up a maintenance schedule and log all visits to the dam for operation, repairs and maintenance.

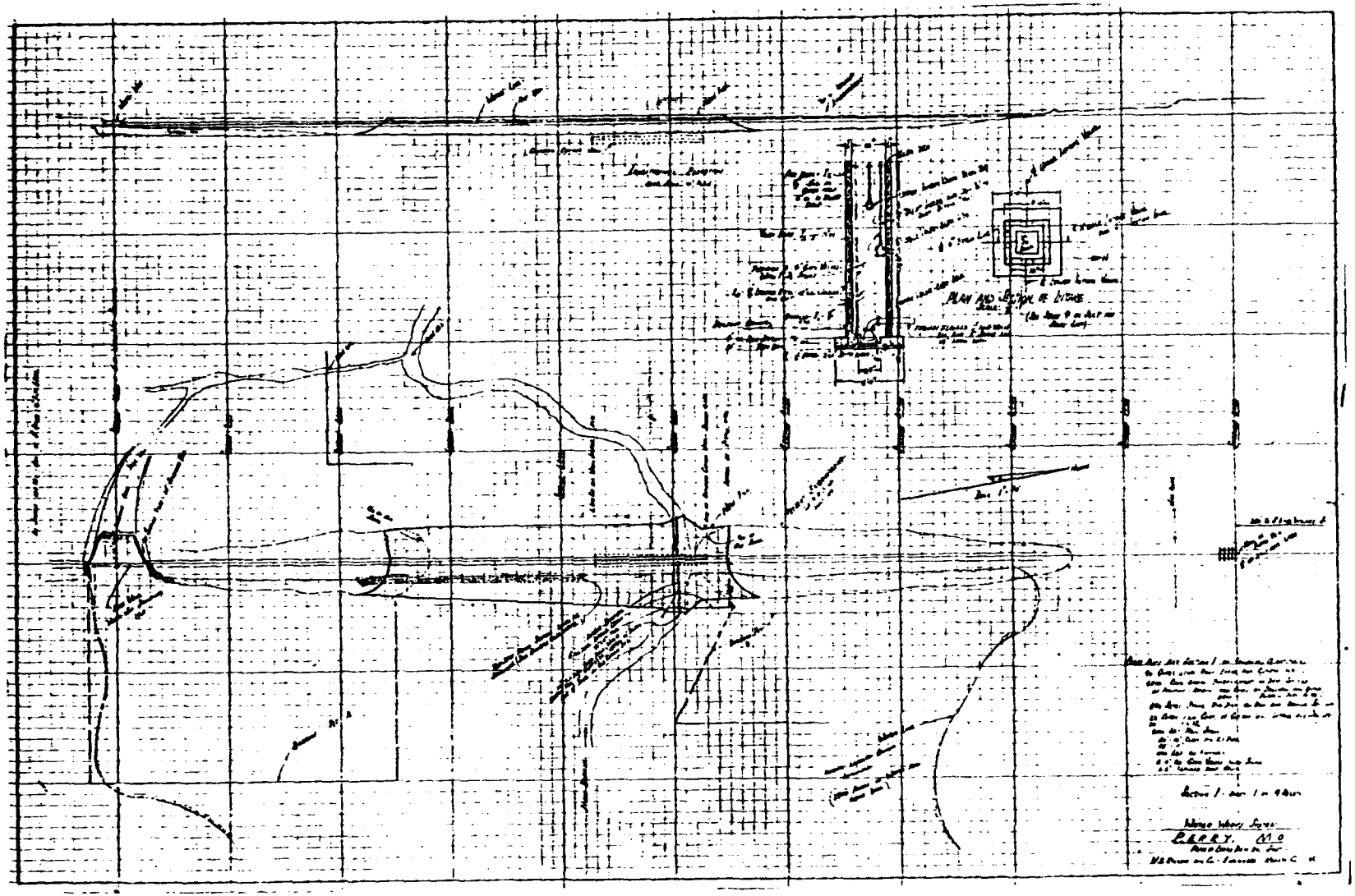
(c) Clear the discharge channel for the low level outlet to prevent submergence of the pipe invert.

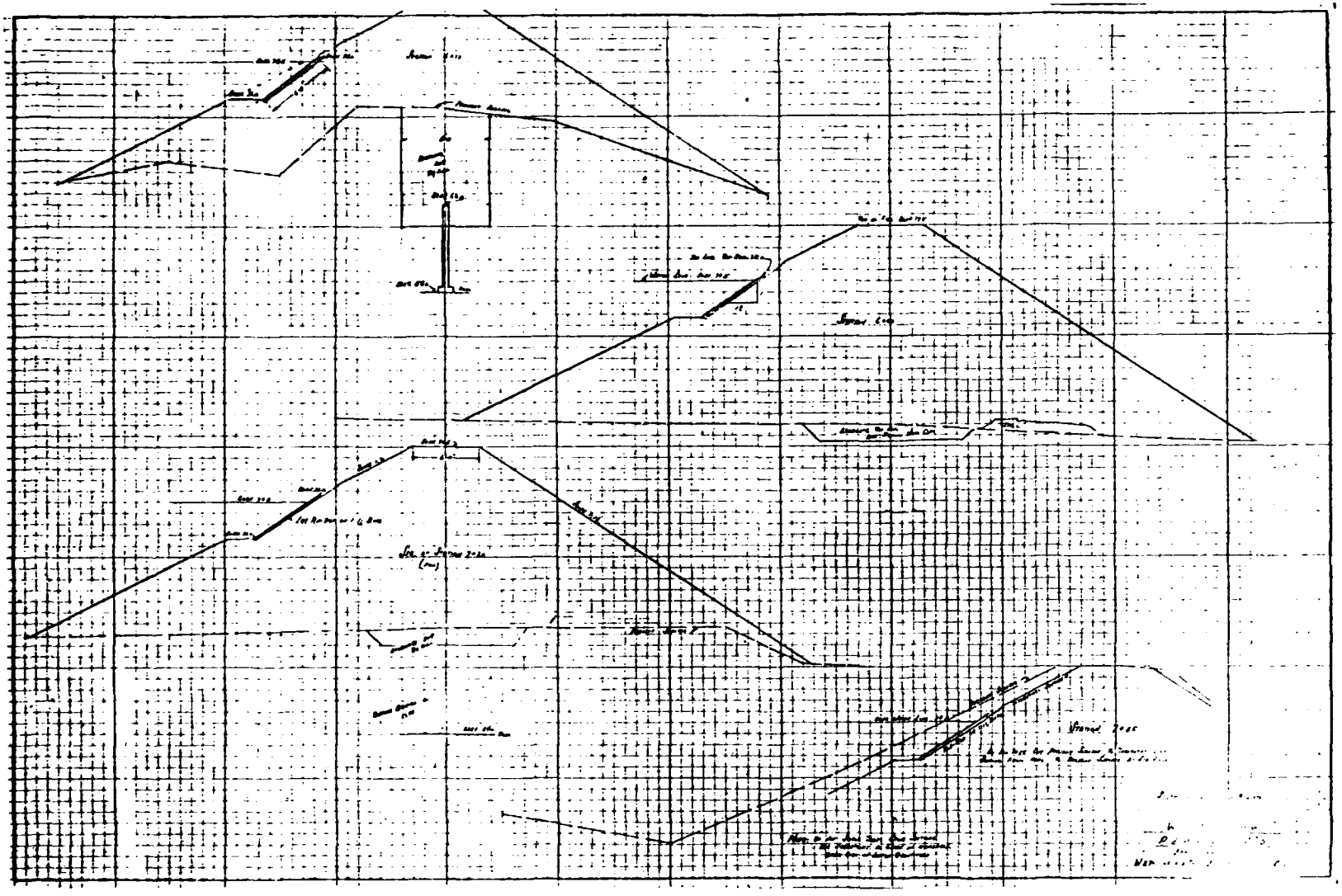
(d) Seepage and stability analyses should be performed by a professional engineer experienced in the desin and construction of dams.

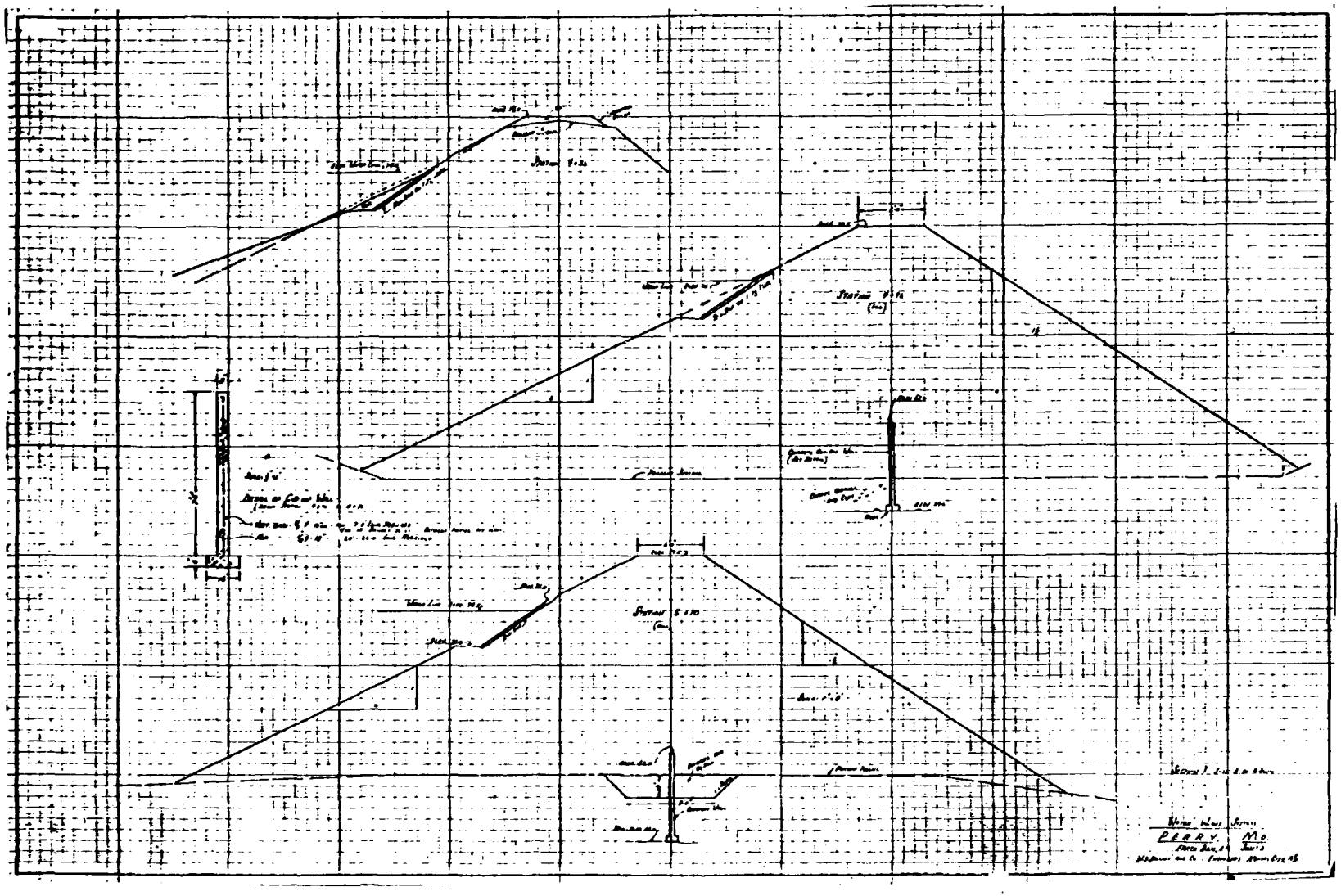
PLATES

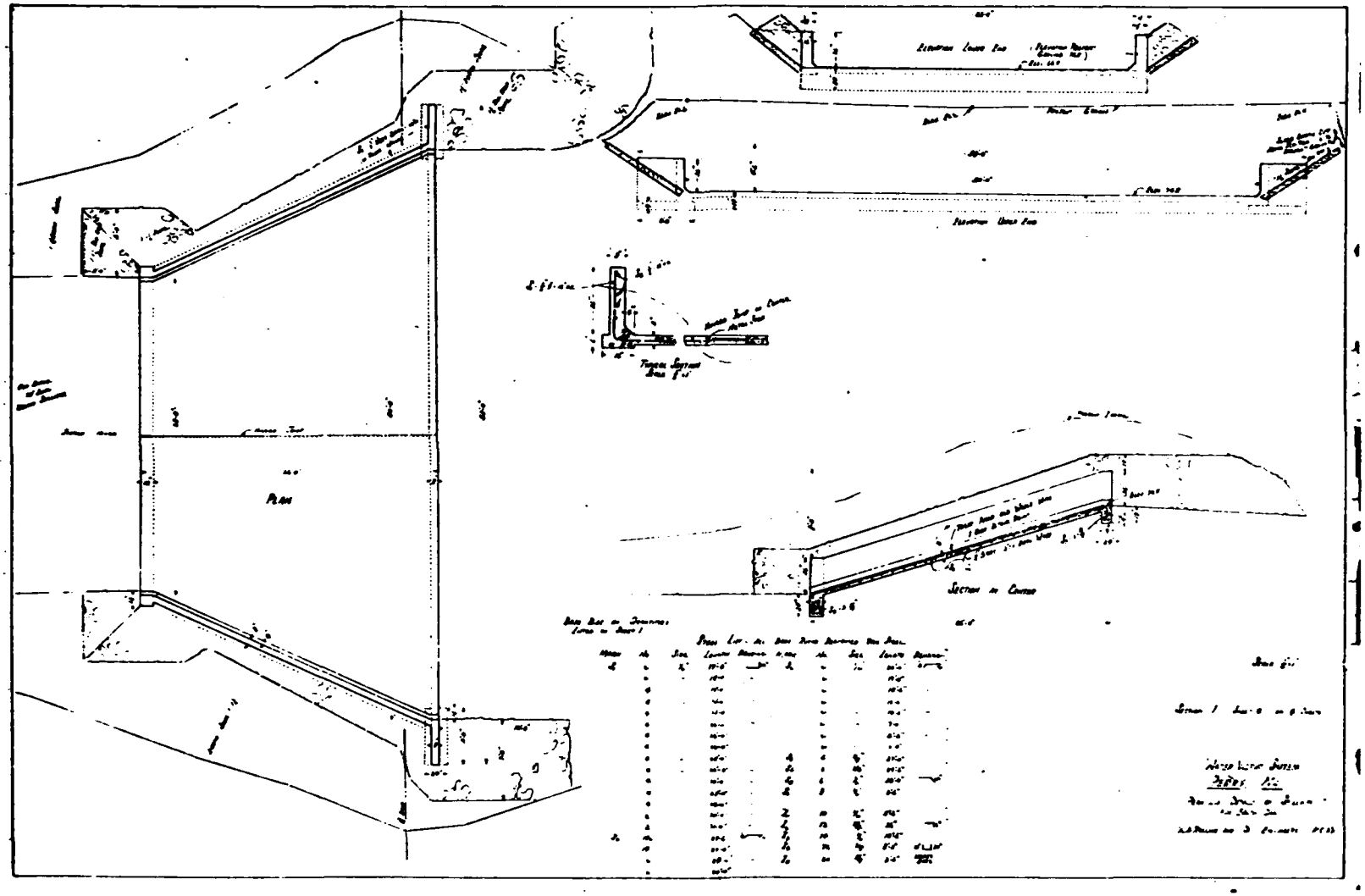


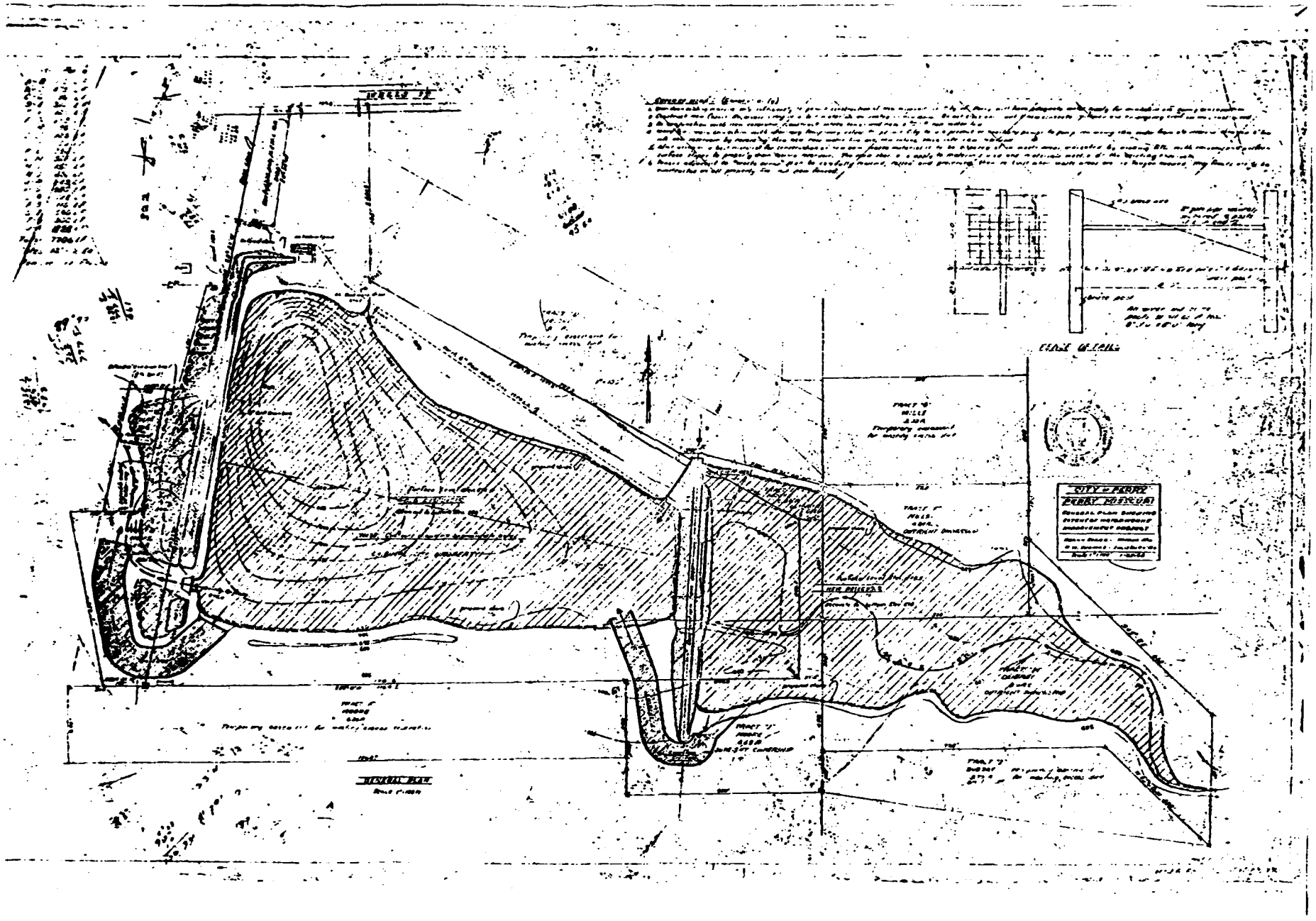
LOCATION MAP
PERRY CITY DAM
RALLS COUNTY, MISSOURI

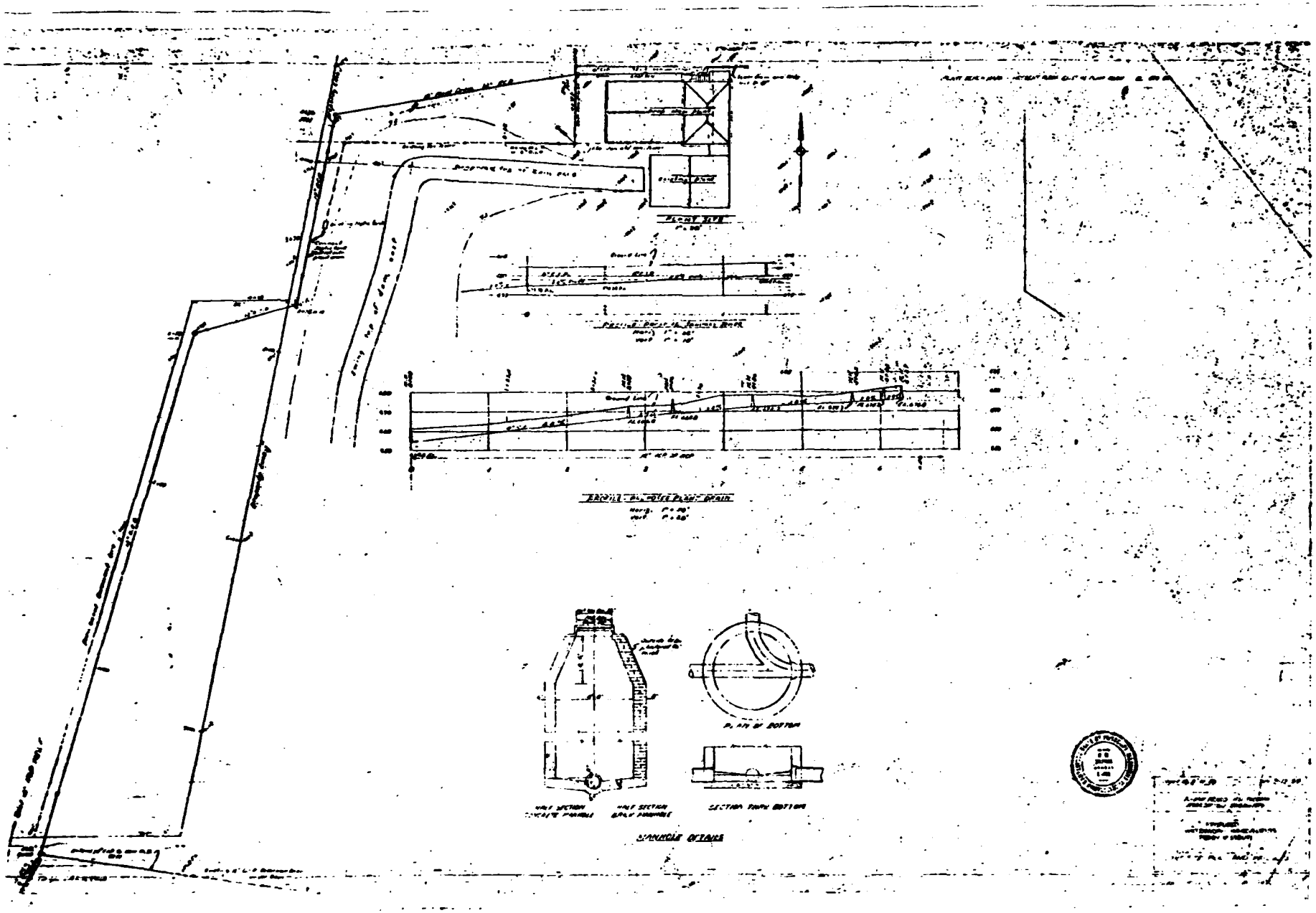

PERRY, MO

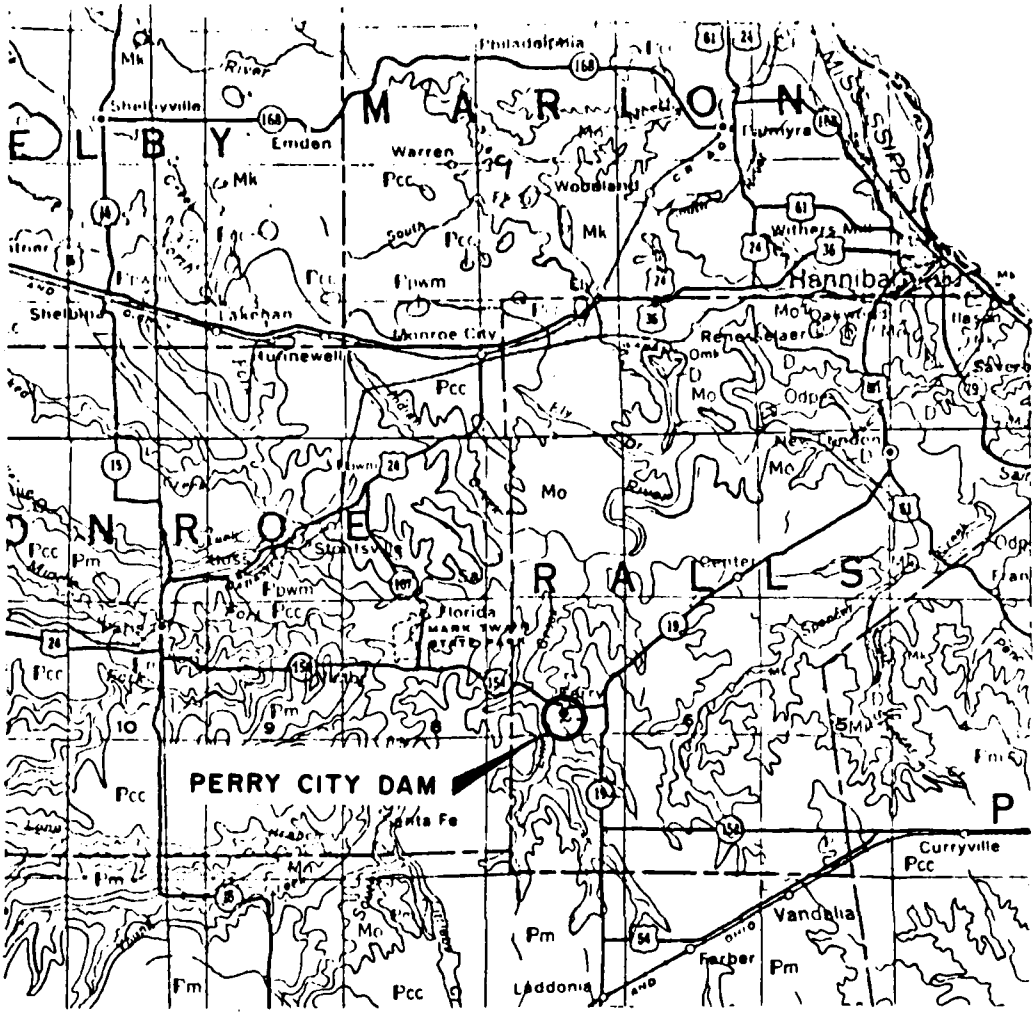



PERRY, MO.


Plan
Section in Centre


CITY OF PERRY
PERRY RESERVOIR
FENCE DETAILS


PLAN OF BOTTOM
SECTION THRU BOTTOM
SANDHOLE DETAILS



Explanation

Pennsylvanian System

P_{kc} - Kansas City group: cyclic deposits with numerous limestones.

P_{pwm} - Pleasanton group: sandstone channel member.

P_{m} - Marmaton group: cyclic deposits with limestones.

P_{cc} - Cherokee group: cyclic deposits, predominately shale, sandstone and coal beds.

Mississippian System

M_{m} - sandy, oolitic, fossiliferous, lithographic, or cherty limestones.

M_{o} - cherty, crinoidal limestone, with some shale.

M_{k} - intercalated limestones and shales.

Devonian System

D - limestones and sandstones.

Silurian System

S - limestones with some shale and chert.

Ordovician System

O_{mk} - shale and limestones.

O_{dp} - shale with thin fossiliferous limestone beds and dense limestone.

Reference: Geologic Map of Missouri, 1961, Division of Geological Survey and Water Resources, State of Missouri.

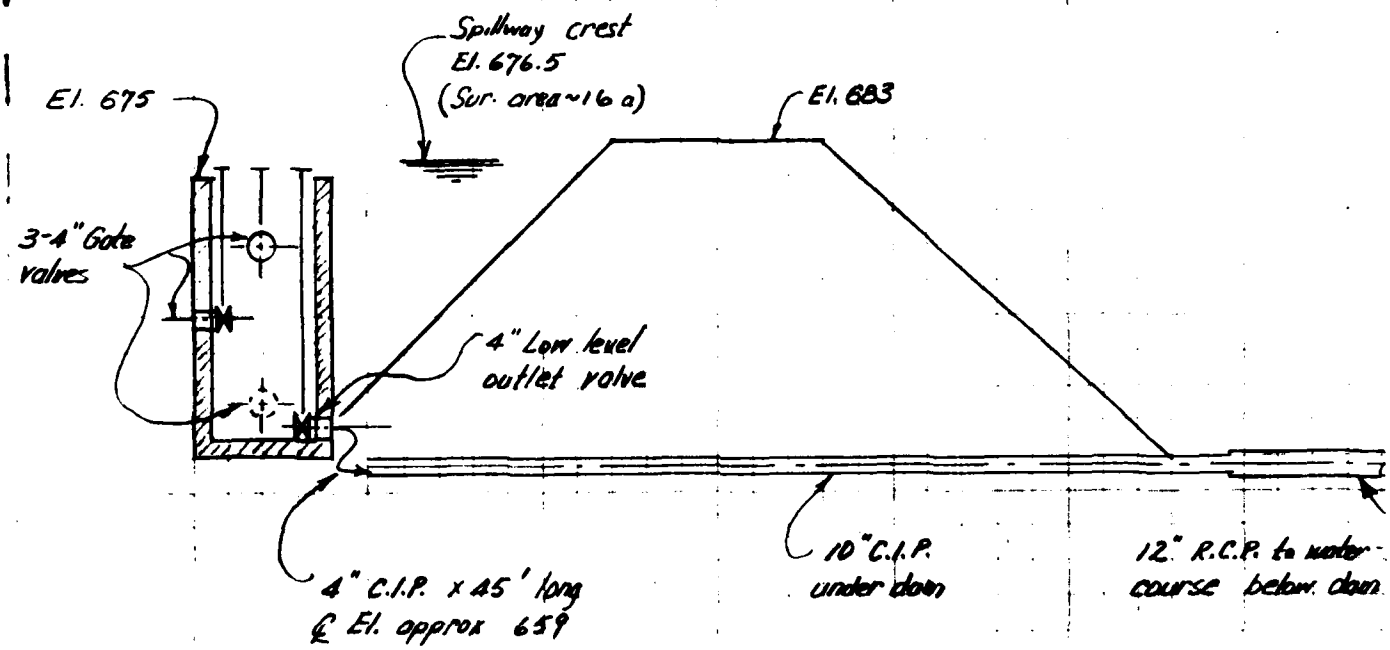
General Geologic Map

ECI-4 ENGINEERING CONSULTANTS, INC.

PERRY CITY DAM - MISSOURI — SHEET NO. 1 OF

JOB NO. 1223

RATING CURVE FOR OUTLET DRAIN — BY JCI DATE 10/27/78



The low level outlet discharge will be controlled principally by the length of 4" C.I.P.

Pipe friction

From Hyd. Institute Tables $F \cong 6.6$ where $h_f = F\frac{v^2}{2g}$ per 100'

Increase friction about 15% for pipe ageing $F = 1.15 \times 6.6 \times \frac{45}{100} = 3.4$

$h_f = 3.4\, v^2/2g$

Entrance Loss : assume $0.5\, v^2/2g$

TOTAL

$3.9\, v^2/2g$	Friction
0.5	Entrance
1.4	Exit
$5.3\, v^2/2g$	

ECI-4 ENGINEERING CONSULTANTS, INC.

PERRY CITY DAM

SHEET NO. 2 OF

JOB NO. 1223

BY JCI DATE 10/27/78

$$H_{total} = 5.3\ v^2/2g = \frac{5.3\,Q^2}{A^2(2g)} = \frac{5.3\,Q^2}{(.087)^2(2g)}$$

$$Q = .087\sqrt{\frac{2gH}{5.3}} = 0.3\sqrt{H}$$

EL.-FT	H-FT	Q-CFS	Q-GPM
664.5	5	.67	302
669.5	10	.95	427
674.5	15	1.16	522
679.5	20	1.34	603

Drawdown rate at design pool elevation

Surface area = 29 acres

time to draw down one foot

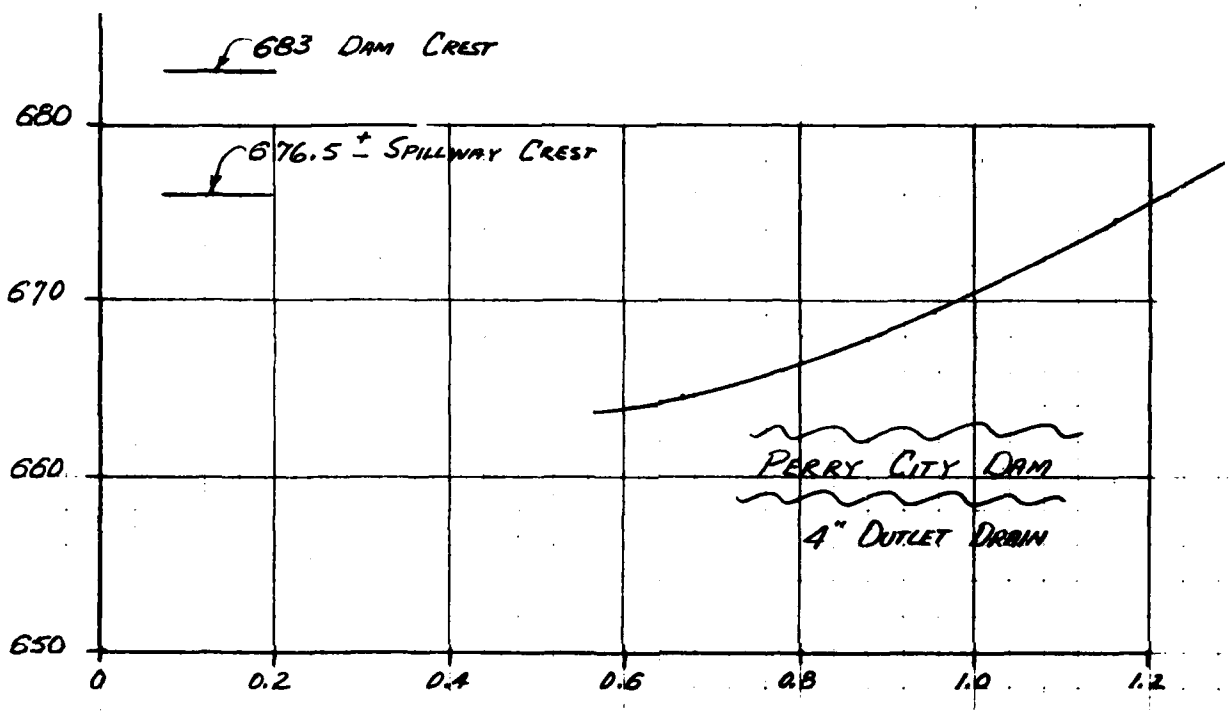
$$= \frac{16\ a\ (43560\ ft^2/a)}{1.22\ ft^3/s\ (60)(60)(24)} = 6.6 \text{ days}$$

ECI-4 ENGINEERING CONSULTANTS, INC.

PERRY CITY DAM — SHEET NO. 3 OF

JOB NO. 1223

LOW LEVEL OUTLET RATING CURVE — BY JCI DATE 10/27/78



APPENDIX A

PHOTOGRAPHS TAKEN DURING INSPECTION

PERRY CITY DAM

Photo 1 - View along crest of dam taken near right abutment.

Photo 2 - Picture of upstream embankment slope taken at right abutment.

Photo 3 - Close-up of upstream embankment slope near right abutment.

Photo 4 - Close-up of typical upstream slope protection.

Photo 5 - Picture of hole eroded behind rock wall protecting upstream slope.

Photo 6 - View along downstream embankment slope taken from left side of dam.

Photo 7 - Close-up of typical desiccation cracks on downstream embankment slopes.

Photo 8 - Picture of treatment plant and pump house for water supply.

Photo 9 - Picture of service spillway taken from left abutment.

Photo 10 - Picture of downstream side of service spillway. Note deteriorated concrete.

Photo 11 - Close-up of cracked concrete floor in service spillway.

Photo 12 - Close-up of eroded concrete and subsequent hole in service spillway.

Photo 13 - Picture of downstream discharge channel for service spillway taken from spillway.

Photo 14 - Close-up of eroded left bank of service spillway discharge channel.

Photo 15 - Picture of grass-lined emergency spillway taken from left side of dam.

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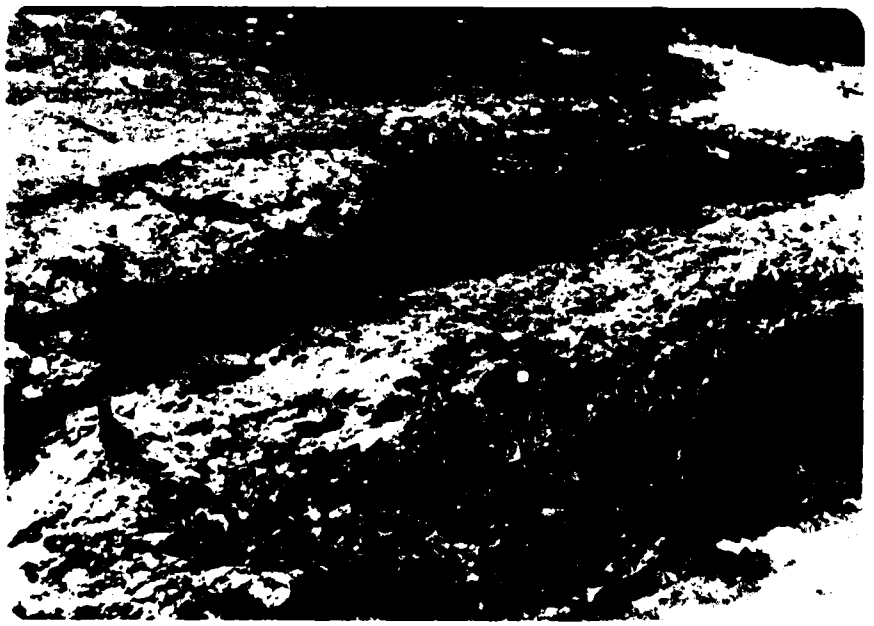

Photo 12 - Close-up of eroded concrete and subsequent hole in service spillway.

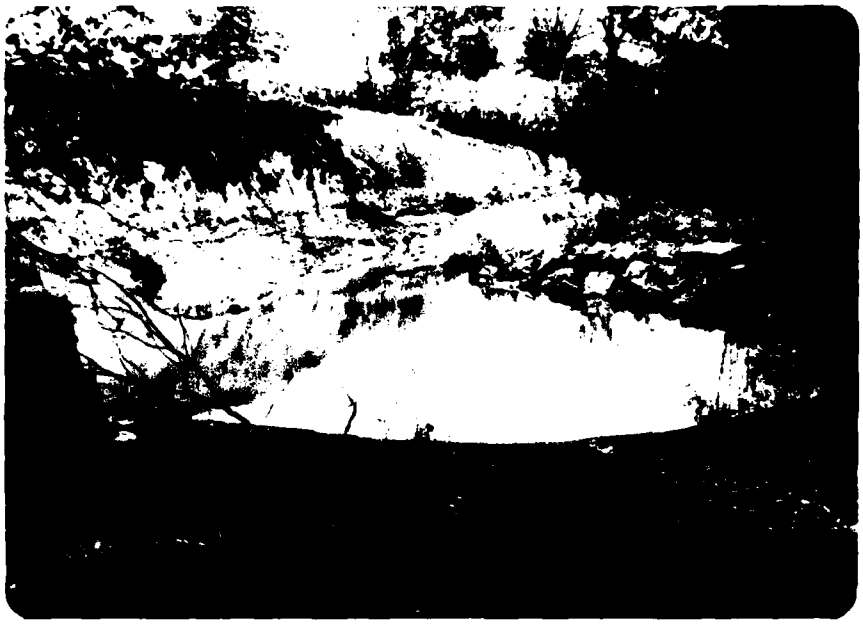

Photo 13 - Picture of downstream discharge channel for service spillway taken from spillway.

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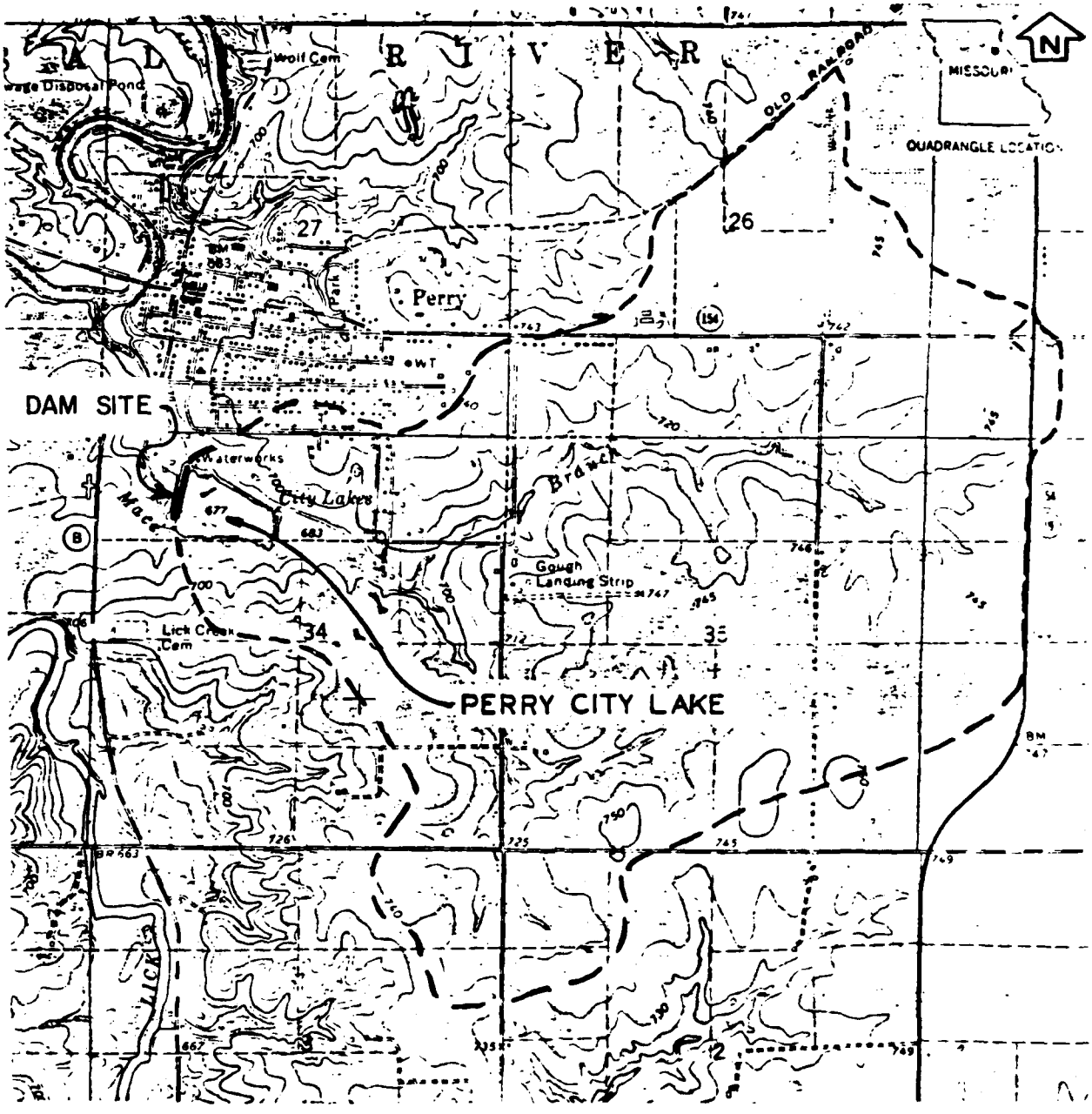
APPENDIX B

HYDROLOGIC COMPUTATIONS



SCALE 1:24 000

1 ½ 0 1 MILE

1000 0 1000 2000 3000 4000 5000 6000 7000 FEET

1 .5 0 1 KILOMETER

CONTOUR INTERVAL 10 FEET

DRAINAGE BOUNDARY — — — — —

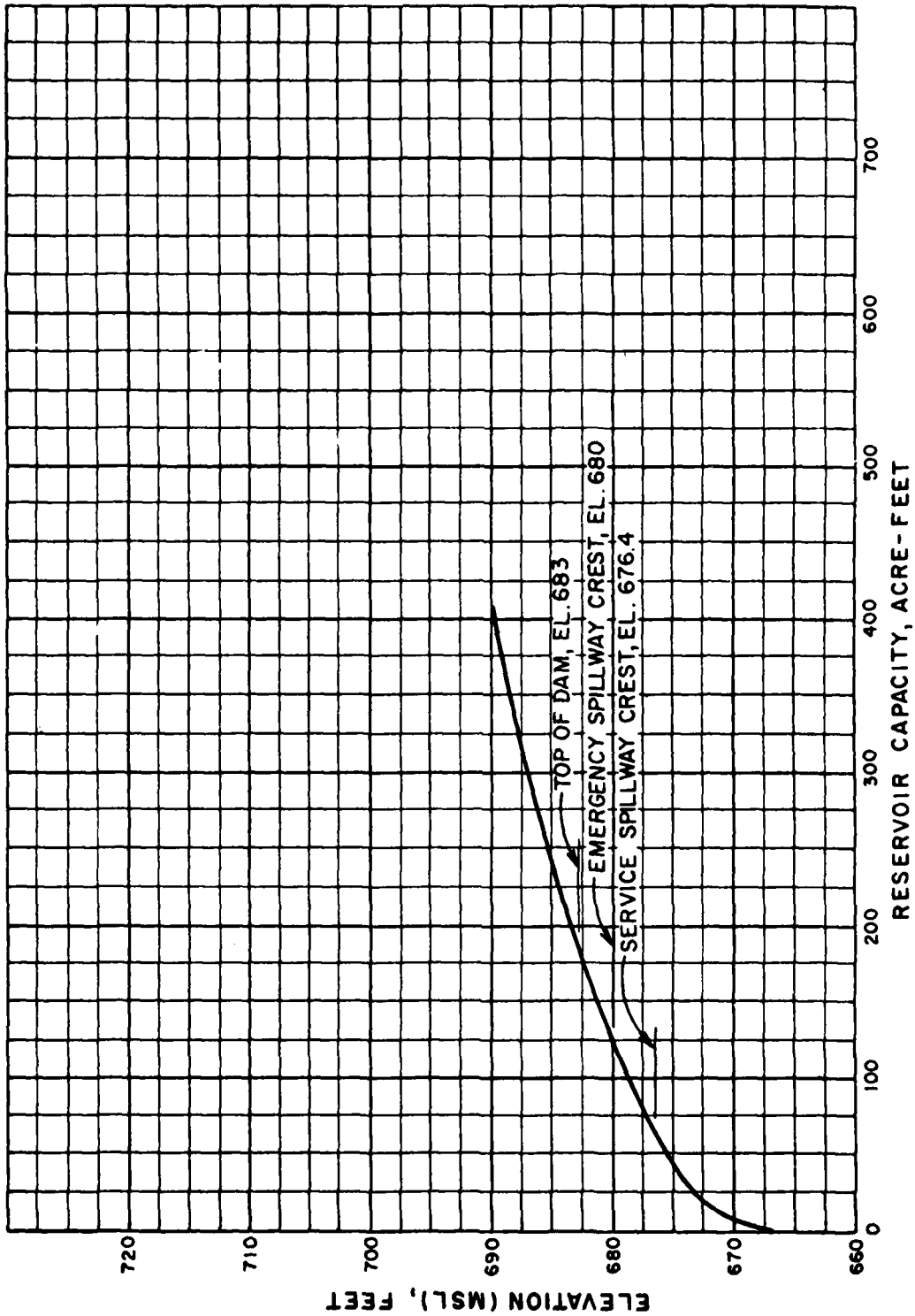
PERRY CITY DAM
DRAINAGE AREA

ECI-4 ENGINEERING CONSULTANTS, INC.

DAM SAFETY INSPECTION – MISSOURI
PERRY CITY DAM (OLD)
RESERVOIR AREA CAPACITY

SHEET NO. 1 OF 2
JOB NO. 1223-001-1
BY KLB DATE 11-2-78

ELEV FT.	SURFACE AREA (ACRES)	INCREMENTAL VOLUME (AC-FT)	TOTAL VOLUME (AC-FT)	REMARKS
667	0	—	0	
670	3.0	4.5	4.5	
673	8.0	16.5	21.0	
675	12.	20.0	41.0	
676.4	16.	19.6	60.6	SPILLWAY CREST
680	20.	64.8	125.4	EMERGENCY SPILLWAY
683	24.	66.0	191.4	TOP OF DAM
690	38.	217	408.4	



PERRY CITY DAM (OLD)
RESERVOIR CAPACITY CURVE

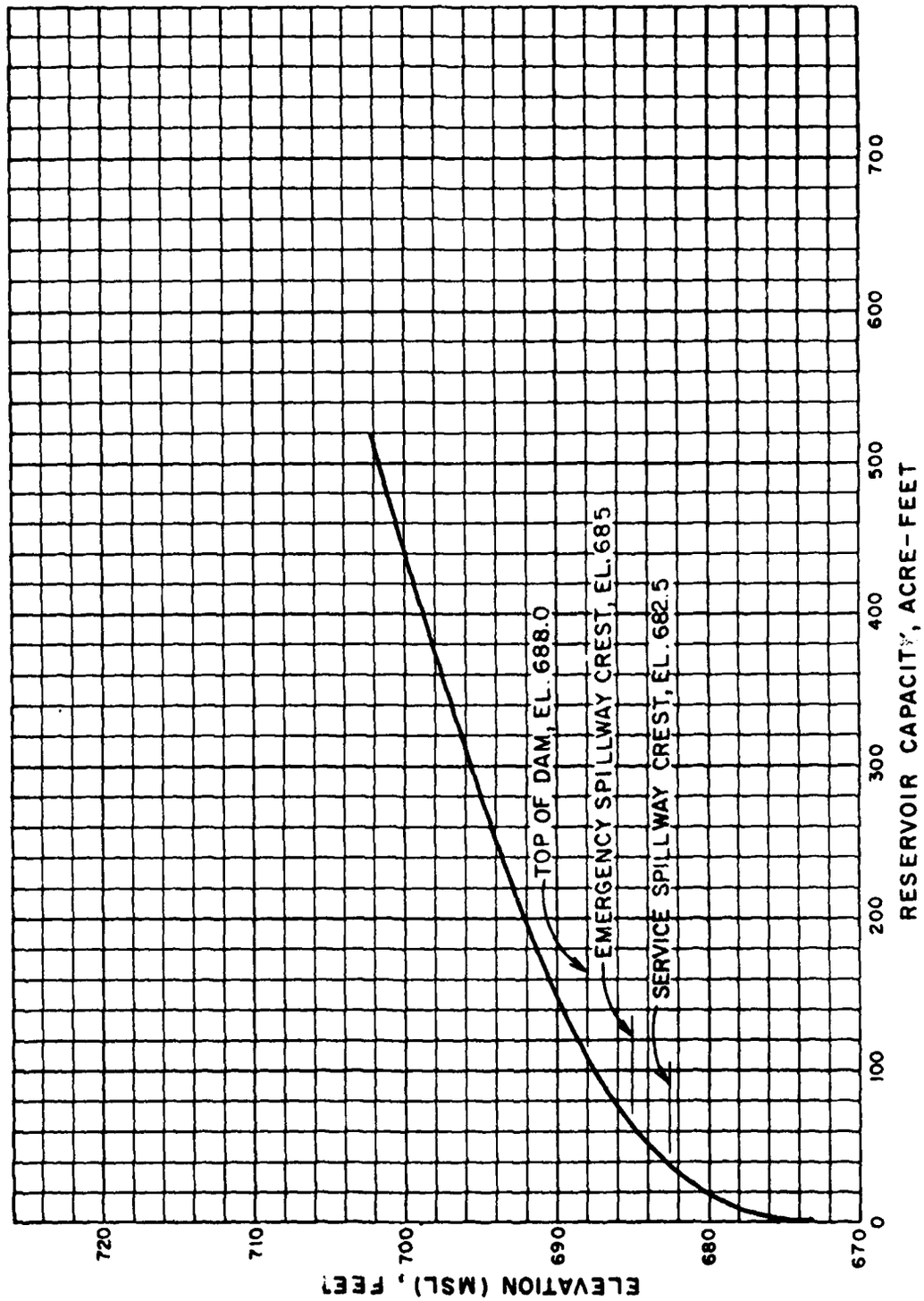
ECI-4 ENGINEERING CONSULTANTS, INC.

DAM SAFETY INSPECTION / MISSOURI — SHEET NO. 1 OF 2
PERRY CITY DAM (NEW) — JOB NO. 1223-001
RESERVOIR AREA CAPACITY — BY MAS DATE 11-1-78

PERRY CITY DAM (NEW)

RESERVOIR AREA CAPACITY

ELEV. FT.	SURFACE AREA (ACRES)	INCREMENTAL VOLUME (AC-FT)	TOTAL VOLUME (AC-FT)	REMARKS
673	0	—	0	
680	5	17.5	17.5	
682.5	9	17.5	35.0	NORMAL WATER SURFACE AT SPILLWAY CREST
685	13	27.5	62.5	EMERGENCY SPILLWAY CREST
688	18	46.5	109.0	TOP OF DAM
690	21	39.0	148.0	
700	52	365.0	513.0	



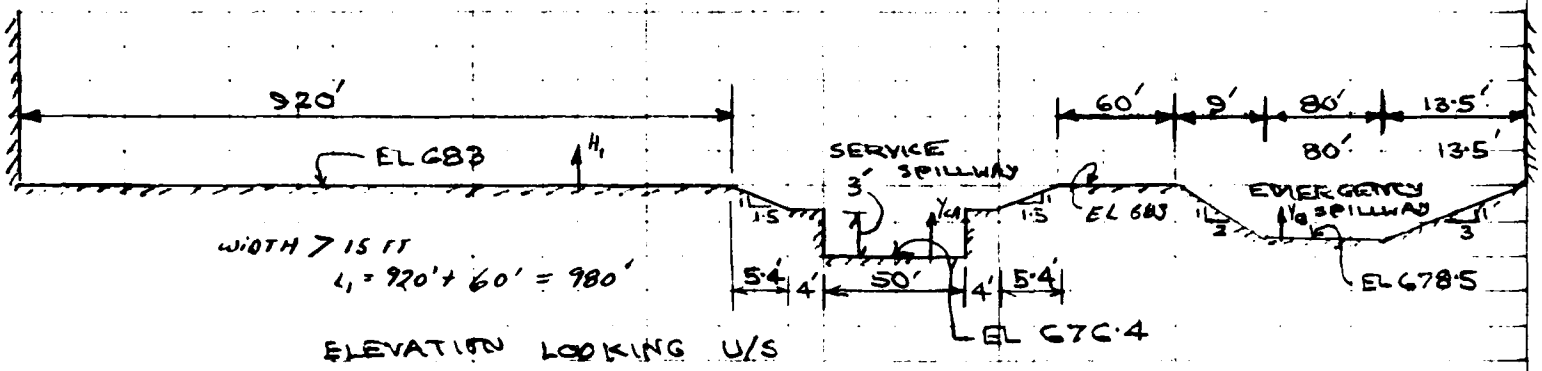
PERRY CITY DAM (NEW)
RESERVOIR CAPACITY CURVE

ECI-4 ENGINEERING CONSULTANTS, INC.

DAM SAFETY INSPECTION / MISSOURI — SHEET NO. 1 OF 2

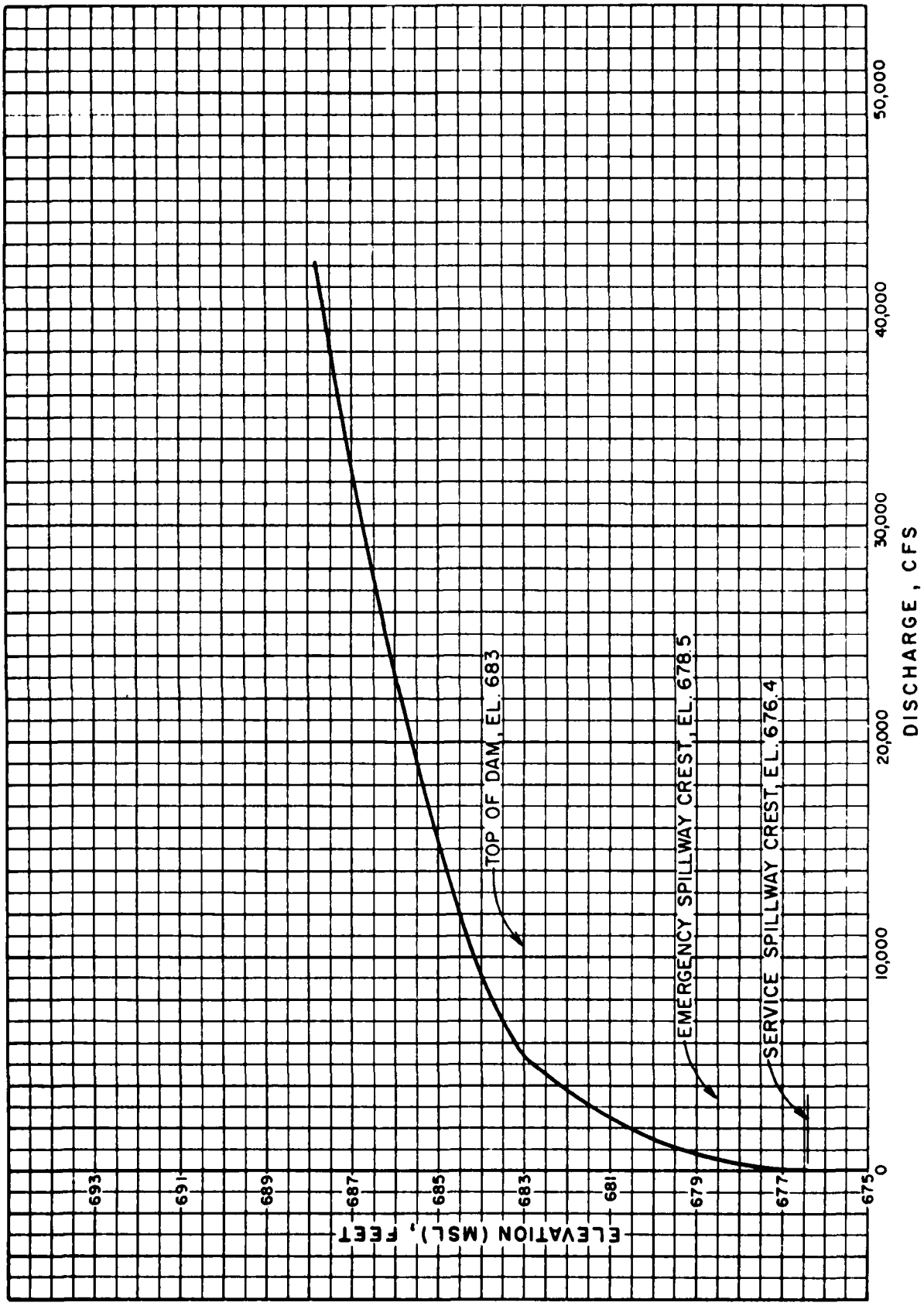
PERRY CITY DAM COLD — JOB NO. 1222-001

SPILLWAYS & OVERTOP DISCHARGE CAPACITY — BY MAS — DATE 11/16/78



ELEVATION LOOKING U/S

Y_{CA}	T_{CA}	A_{CA}	$V_{CA} = 5.67 \times \sqrt{\frac{A_{CA}}{T_{CA}}}$	$\frac{V_{CA}^2}{2g}$	U.S. W.S. $= Y_{CA} + \frac{V_{CA}^2}{2g}$	$Q_{CA} = V_{CA} A_{CA}$	$Y_{CB} = \frac{2}{3} \times$ (W.S. − 678.5)	T_{CB}	A_{CB}	V_{CB}	Q_{CB}	H_1	L_1	C_1	$Q_T = Q_{CA} + Q_{CB} + C_1 L_1 H_1^{3/2}$
1	50	50	5.67	0.5	(677.9) 1.5	284	—	—	—	—	—	—	—	—	284
2	50	100	8.02	1.0	(679.4) 3.0	802	0.6	83	48.9	4.35	213	—	—	—	802 + 213 = 1015
3	50	150	9.82	1.5	(680.9) 4.5	1473	1.6	88	134.4	7.01	942	—	—	—	1473 + 942 = 2415
4	61	207.5	10.51	1.7	(682.1) 5.7	2202	2.4	92	206.4	8.49	1753	—	—	—	2202 + 1753 = 3955
5	69	270.0	11.69	2.1	(683.5) 7.1	3180	3.33	96.7	299.2	9.89	2910	0.5	980	2.70	3180 + 2910 + 2.70 × 980 × 0.5$^{1.5}$ = 7026
6	67	337.5	12.73	2.5	(684.9) 8.5	4296	4.27	101.3	387.2	11.08	4291	1.9	980	2.63	4296 + 4291 + 2.63 × 980 × 1.9$^{1.5}$ = 15232
7	68.0	405.0	13.77	2.9	(686.3) 9.9	5588	5.20	102.5	482.4	12.30	5939	3.3	980	2.63	5588 + 5939 + 2.63 × 980 × 3.3$^{1.5}$ = 26973
8	68.0	474.6	14.89	3.4	(687.8) 11.4	7067	6.20	102.5	584.9	13.54	7922	4.8	980	2.63	7067 + 7922 + 2.63 × 980 × 4.8$^{1.5}$ = 42094



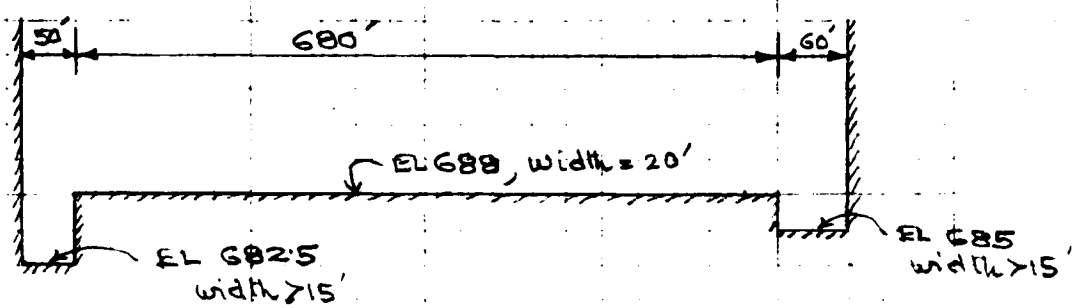
PERRY CITY DAM (OLD)
SPILLWAY AND OVERTOP RATING CURVE

ECI-4 ENGINEERING CONSULTANTS, INC.

DAM SAFETY INSPECTION/MISSOURI SHEET NO. 1 OF 4

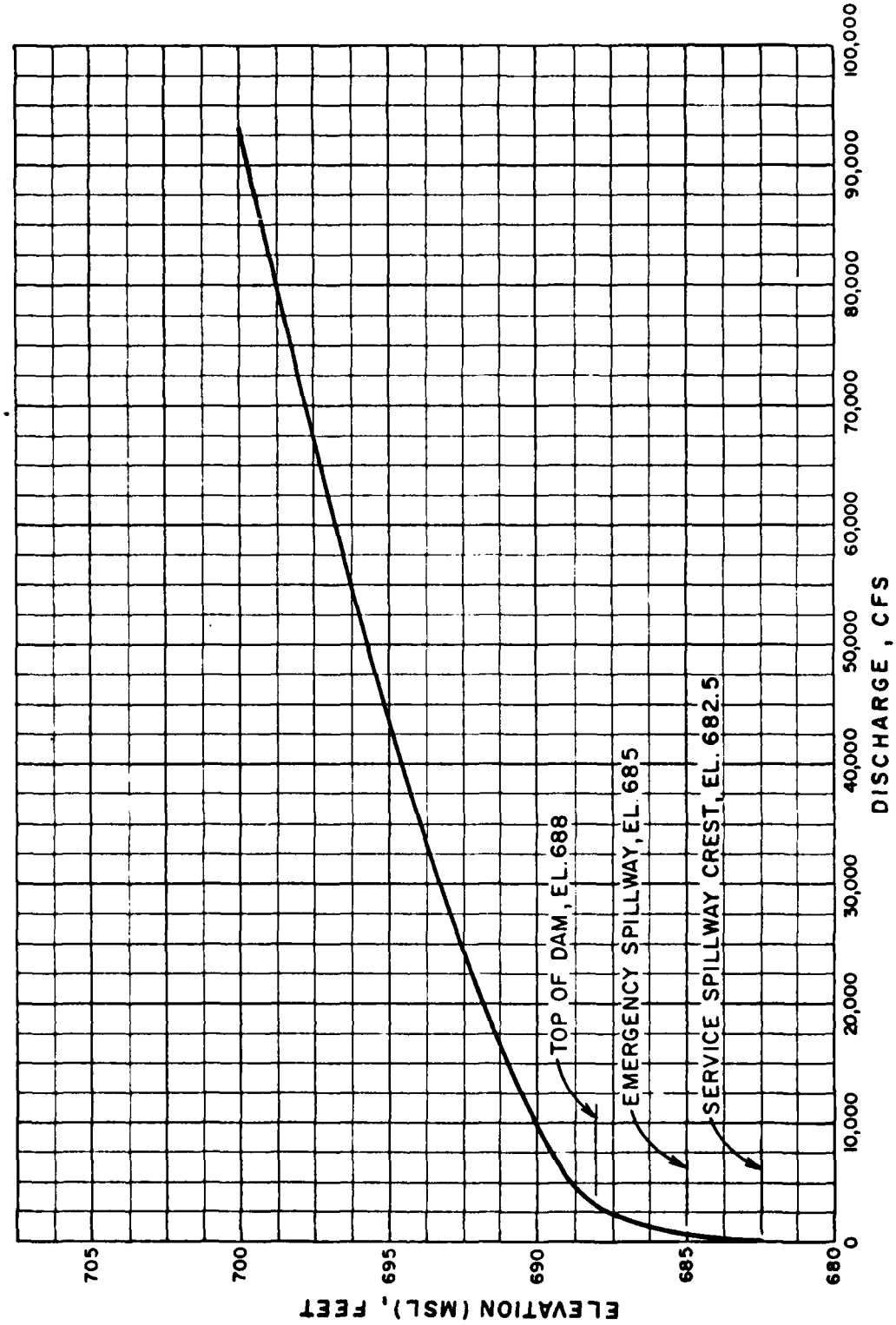
PEKRY CITY DAM (NEW) JOB NO. 1222-001

SPILLWAYS & OVERTOP DISCHARGE CAPACITY BY MAG DATE 11/16/78



$L_1 = 50'$, $L_2 = 60'$, $L_3 = 680'$

ELEVATION FT.	H_1	H_2	H_3	L_1	L_2	L_3	C_1	C_2	C_3	$Q = \sum_{i=1}^{5} C_i L_i H_i^{3/2}$
682.5	0.0			50			–			0
683.0	0.5			50			2.70			48
684.0	1.5			50			2.63			242
685.0	2.5	0.0		50	60		2.63	–		520
686.0	3.5	1.0		50	60		2.63	2.63		1019
687.0	4.5	2.0		50	60		2.63	2.63		1701
688.0	5.5	3.0	0.0	50	60	680	2.63	2.63	–	2516
689.0	6.5	4.0	1.0	50	60	680	2.63	2.63	2.63	5227
690.0	7.5	5.0	2.0	50	60	680	2.63	2.63	2.63	9523
692.0	9.5	7.0	4.0	50	60	680	2.63	2.63	2.63	21080
695.0	12.5	10.0	7.0	50	60	680	2.63	2.63	2.63	43724
700.0	17.5	15.0	12.0	50	60	680	2.63	2.63	2.63	98136



PERRY CITY DAM (NEW)
SPILLWAY & OVERTOP RATING
CURVE

ENGINEERING CONSULTANTS, INC.

DAM SAFETY INSPECTION - MISSOURI
PERRY CITY DAM (OLD)
UNIT HYDROGRAPH PARAMETERS

SHEET NO. 1 OF 3
JOB NO. 1223-001-1
BY KLB DATE 11-3-78

1. DRAINAGE AREA = 74 AC. = 0.12 SQ. MI

2. LENGTH OF STREAM, $L = (1'' \times 2000' / 5280) = 0.38 MI$

3. DIFFERENCE IN ELEV, $\Delta H = 735 - 676.4 = 58.6$ FT

4. TIME OF CONCENTRATION, T_c:

$$T_c = \left(\frac{11.9 \times L^3}{\Delta H}\right)^{0.385}$$

$$T_c = \left(\frac{11.9 \times 0.38^3}{58.6}\right)^{0.385} = \underline{0.18 \text{ HR}}$$

5. LAG TIME, L_t:

$$L_t = 0.6 \times T_c = 0.6 \times 0.18 = 0.11 \text{ HR}$$

6. RAINFALL UNIT DURATION

$$D \leq \frac{L_t}{4} = \frac{0.11}{4} = 0.03$$

USE D = 5 MIN = 0.083 HR

MINIMUM DURATION CRITERIA.

7. TIME TO PEAK, T_p:

$$T_p = \frac{D}{2} + 0.6 \times T_c$$

$$T_p = \frac{0.083}{2} + 0.6 \times 0.18$$

$$T_p = 0.15$$

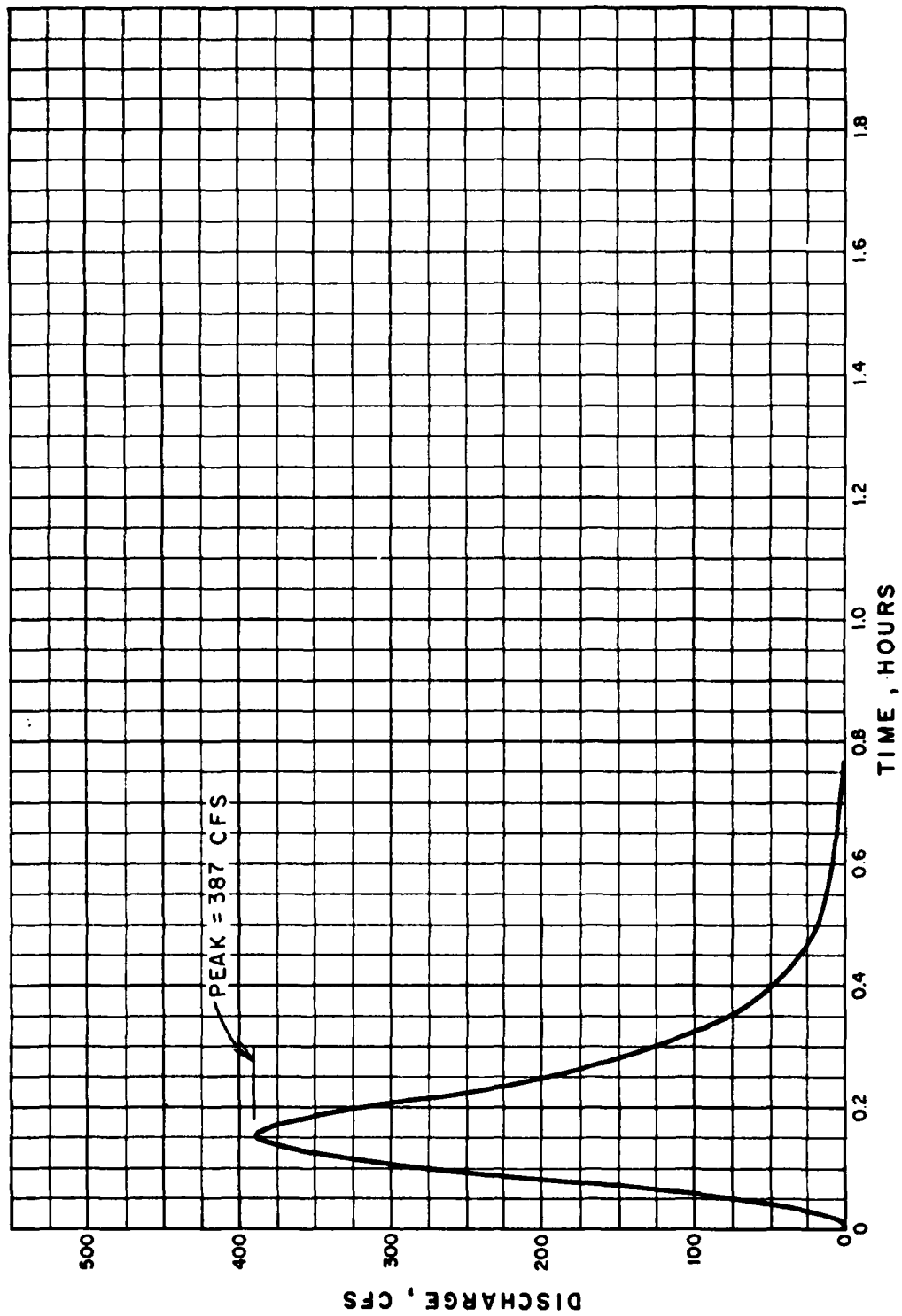
8. $q_p = 484 \times A / T_p = \frac{484 \times 0.12}{0.15} = \underline{387.20 \text{ CFS}}$

ENGINEERING CONSULTANTS, INC.

DAM SAFETY INSPECTION - MISSOURI — SHEET NO. 2 OF 3
PERRY CITY DAM (OLD) — JOB NO. 1223-001-1
UNIT HYDROGRAPH DERIVATION — BY KLB DATE 11-3-78

9) CURVILINEAR UNIT HYDROGRAPH

TIME T/T_p	DISCHARGE RATIO q/q_p	UNIT HYDROGRAPH TIME, T (HR)	UNIT HYDROGRAPH DISCHARGE (CFS)
0.00	0.000	0.00	0.000
0.1	0.015	0.02	5.81
0.2	0.075	0.03	29.04
0.3	0.16	0.05	61.95
0.4	0.28	0.06	108.42
0.5	0.45	0.08	174.24
0.6	0.60	0.09	232.32
0.7	0.77	0.11	298.14
0.8	0.89	0.12	344.61
0.9	0.97	0.14	375.58
1.0	1.00	0.15	387.20
1.1	0.98	0.17	379.46
1.2	0.92	0.18	356.22
1.3	0.84	0.20	325.25
1.4	0.75	0.21	290.40
1.5	0.66	0.23	255.55
1.6	0.56	0.24	216.83
1.8	0.42	0.27	162.62
2.0	0.32	0.30	123.90
2.2	0.24	0.33	92.93
2.4	0.18	0.36	69.70
2.6	0.13	0.39	50.34
2.8	0.098	0.42	37.95
3.0	0.075	0.45	29.04
3.5	0.036	0.53	13.94
4.0	0.018	0.60	6.97
4.5	0.009	0.68	3.48
5.0	0.004	0.75	1.55



PERRY CITY DAM (OLD)
5 MINUTE UNIT HYDROGRAPH

ECI-4 ENGINEERING CONSULTANTS, INC.

DAM SAFETY INSPECTION – MISSOURI — SHEET NO. 1 OF

PERRY CITY NEW DAM — JOB NO. 1223-001-1

UNIT HYDROGRAPH PARAMETERS — BY KLB DATE 11-3-78

1. DRAINAGE AREA = 1509 AC = 2.36 SQ. MI.

2. LENGTH OF STREAM = L = (5.33" x 2000') / 5280 = 2.02 mi

3. BASIN SLOPE = ΔH

$$\Delta H = 747 - 683 = 64$$

4. TIME OF CONCENTRATION

$$T_c = \left(\frac{11.9 \times L^3}{\Delta H}\right)^{0.385}$$

$$T_c = \left(\frac{11.9 \times 2.02^3}{64}\right)^{0.385}$$

$$T_c = 1.18 \text{ HR}$$

5. LAG TIME = $L_t = 0.6 \times T_c$

$$L_t = 0.6 \times 1.18 \quad 0.71 \text{ HR}$$

6. RAINFALL UNIT DURATION $D \leq \frac{L_t}{4}$

$$D \leq \frac{L_t}{4} = \frac{0.71}{4} = 0.18$$

USE D = 0.083 HR = 5 MIN, TO MATCH DOWNSTREAM COMPUTATIONS

7. TIME TO PEAK, T_p

$$T_p = \frac{D}{2} + 0.6 \times T_c = \frac{0.083}{2} + 0.6 \times 1.18$$

$$T_p = 0.75$$

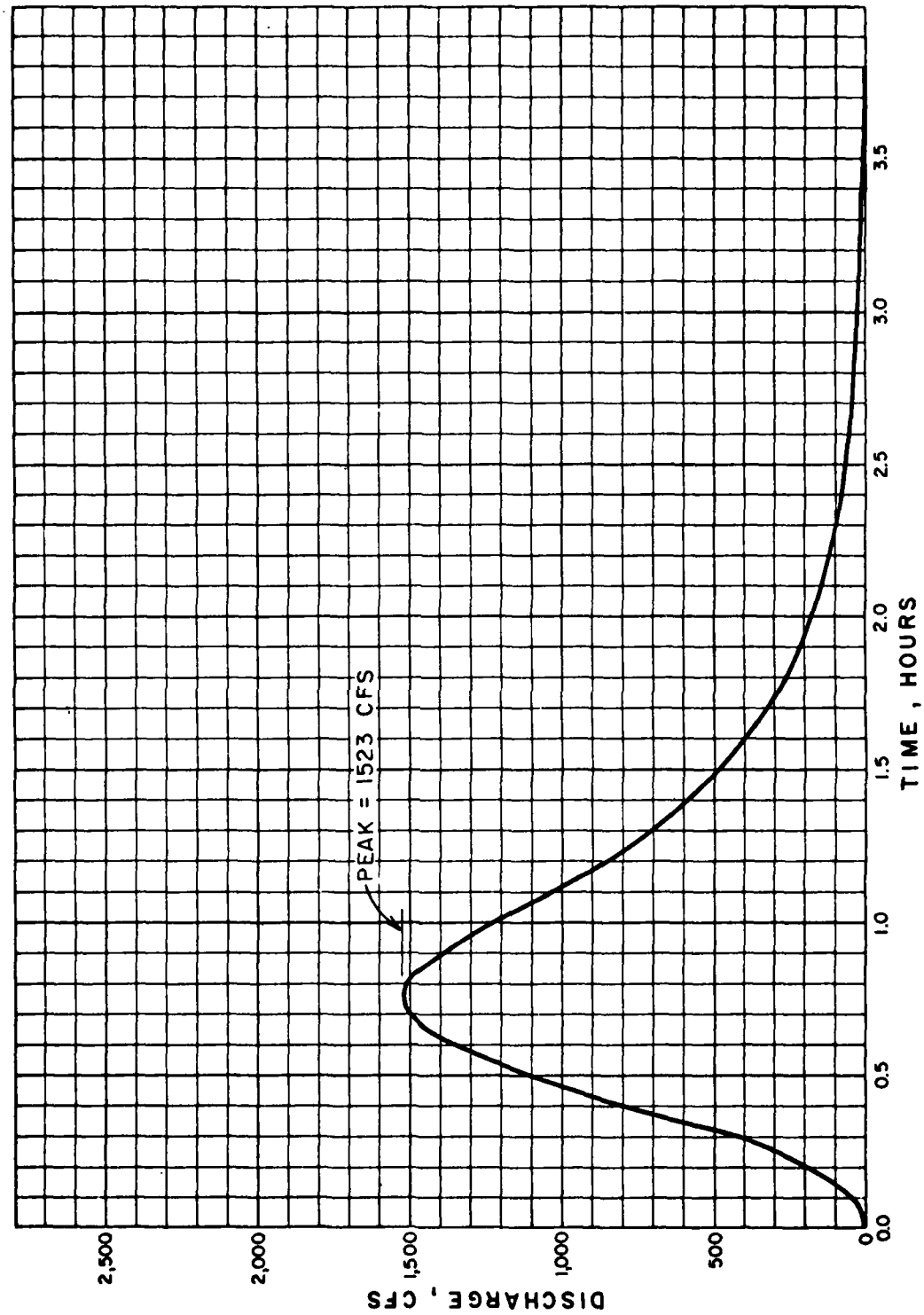
8. $$q_p = \frac{484 \times A}{T_p} = \frac{484 \times 2.36}{0.75} = 1523.$$

ECI-4 ENGINEERING CONSULTANTS, INC.

DAM SAFETY INSPECTION - MISSOURI — SHEET NO. 2 OF
PERRY CITY NEW DAM — JOB NO. 1223-001-1
UNIT HYDROGRAPH DERIVATION — KLB DATE 11-3-78

9) CURVILINEAR UNIT HYDROGRAPH

TIME T/Tp	DISCHARGE RATIO q/qp	UNIT HYDROGRAPH TIME, T (HOURS)	UNIT HYDROGRAPH DISCHARGE (CFS)
0.0	0.000	0.00	0.000
0.1	0.015	0.08	22.85
0.2	0.075	0.15	114.23
0.3	0.16	0.23	243.68
0.4	0.28	0.30	426.44
0.5	0.45	0.38	685.35
0.6	0.60	0.45	913.80
0.7	0.77	0.53	1172.71
0.8	0.89	0.60	1355.47
0.9	0.97	0.68	1477.31
1.0	1.00	0.75	1523.00
1.1	0.98	0.83	1492.54
1.2	0.92	0.90	1401.16
1.3	0.84	0.98	1279.32
1.4	0.75	1.05	1142.25
1.5	0.66	1.13	1005.18
1.6	0.56	1.20	852.88
1.8	0.42	1.35	639.66
2.0	0.32	1.50	487.36
2.2	0.24	1.65	365.52
2.4	0.18	1.80	274.14
2.6	0.13	1.95	197.99
2.8	0.098	2.10	149.25
3.0	0.075	2.25	114.23
3.5	0.036	2.63	54.83
4.0	0.018	3.00	27.41
4.5	0.009	3.38	13.71
5.0	0.004	3.75	6.09



PERRY CITY DAM (NEW)
5 MINUTE UNIT HYDROGRAPH

ECI-4 ENGINEERING CONSULTANTS, INC.

DAM SAFETY INSPECTION/MISSOURI — SHEET NO. 1 OF 2
PERRY CITY DAM (OLD) — JOB NO. 1223-001
PROBABLE MAXIMUM STORM (PMS) — BY MAS DATE 11/20/78

DETERMINATION OF PMS

1. Determine drainage area of the basin

   D.A. = 1583 acres = 2.47 sq. mi.

2. Determine PMP Index rainfall:

   Location of centroid of basin:

   Long. 91.65°; Lat.: 39.42°

   → PMP for 200 sq. mi. & 24 hrs duration

   = 24.4" (from Fig 1, HMR No 33)

3. Determine basin rainfall interms of percentage of PMP Index rainfall for various durations:

   Location: Long. 91.65°; Lat. 39.42°

   ⇒ Zone 7

Duration (Hrs.)	Percent of Index rainfall (%)	Total rainfall (Inches)	Rainfall increments (Inches)	Duration of increment (Hrs.)
6	100	24.4	24.4	6
12	120	29.3	4.9	6
24	130	31.7	2.4	12

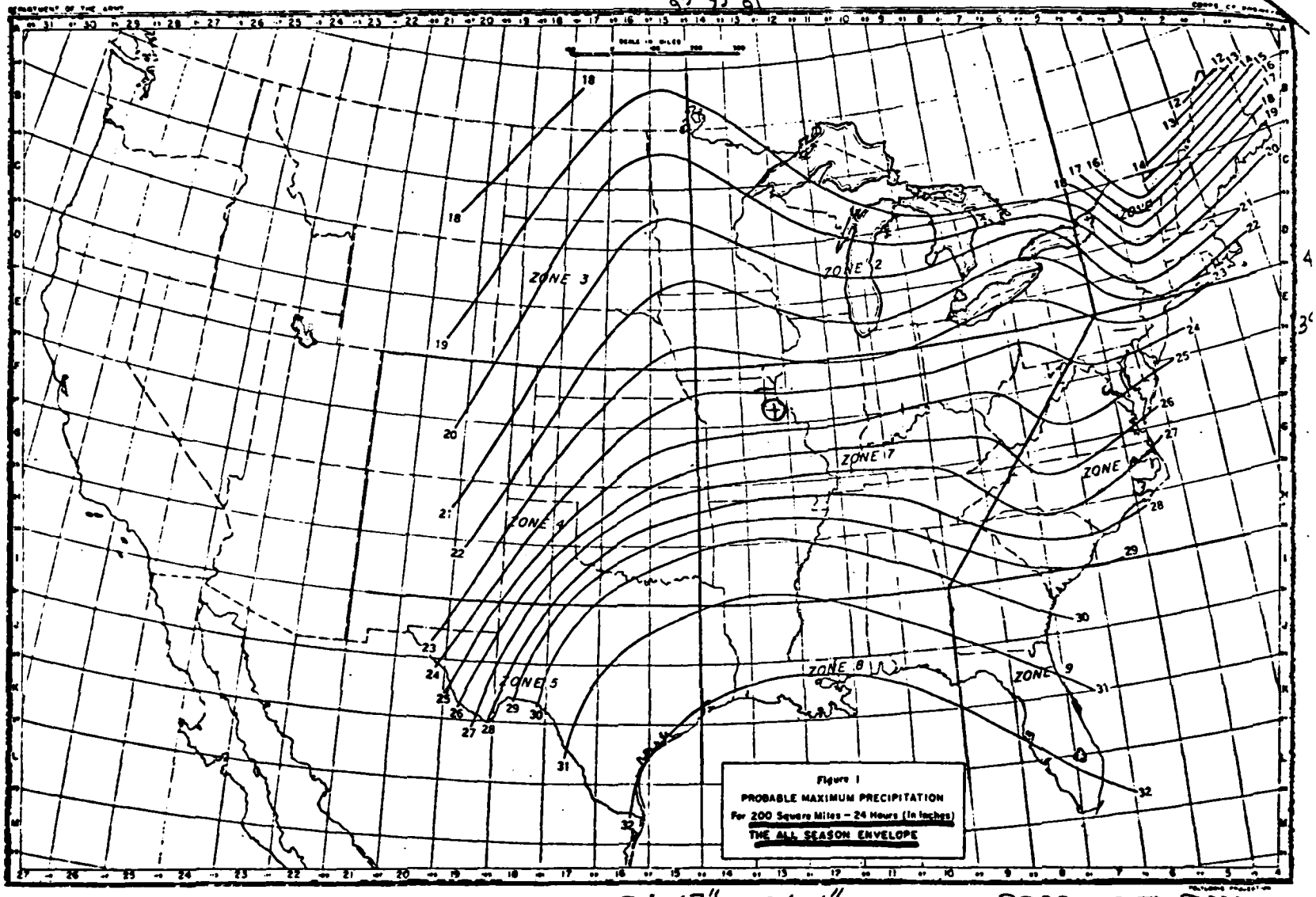


Figure 1
PROBABLE MAXIMUM PRECIPITATION
For 200 Square Miles – 24 Hours (In Inches)
THE ALL SEASON ENVELOPE

24.43" ≃ 24.4"

PERRY CITY DAM
DETERMINATION OF PMP

ECI-4 ENGINEERING CONSULTANTS, INC.

DAM SAFETY INSPECTION / MISSOURI — SHEET NO. 1 OF 1

PERRY CITY DAM (OLD) — JOB NO. 1223-001

100-YEAR FLOOD BY REGRESSION EQUATION — BY MAB DATE 11/21/78

PERRY CITY DAM (OLD)

100-YEAR FLOOD BY REGRESSION EQUATION

Regression equation for 100-year flood for Missouri:

$$Q_{100} = 85.1\, A^{0.934} A^{-0.02}\, S^{0.576}$$

where

A = drainage area in sq. mi

S = main channel slope, ft./mi. (Avg. slope between 0.1L and 0.85L, L being the length of the main channel).

For Perry City Dam:

$A = 2.47$ sq. mi.

$$S = \frac{735-689}{0.75 \times 2.02} \text{ ft/mi} = 30.36 \text{ ft/mi}$$

$$Q_{100} = 85.1\,(2.47)^{0.934}\,(2.47)^{-0.02}\,(30.36)^{0.576}$$

$$= \underline{\underline{1393 \text{ cfs}}}$$

HEC1DB INPUT DATA

```
**********************************
FLOOD HYDROGRAPH PACKAGE (HEC-1)
DAM SAFETY VERSION      JULY 1978
  LAST MODIFICATION  21 AUG 78
**********************************

  1   A1                    DAM SAFETY INSPECTION - MISSOURI
  2   A2                          PERRY CITY DAM
  3   A3              PMF AND 50 PERCENT PMF DETERMINATION AND ROUTING
  4   R     300       0       5       0       0       0       0       0       0       0
  5   H1      5
  6   J       1       2       1
  7   J1    1.0     0.5
  8   K       0      12                                                   1
  9   K1      INPUT INDEX PRECIPITATION AND RATIOS, INPUT SCS UNIT HYDROGRAPH, NEW DAM
 10   M       1      -1    2.36            2.36     1.0
 11   P1            24.4     100     120     130
 12   T                                                     1.00    0.08
 13   L      45
 14   P1     0.0      23     130     280     505     840    1090    1310    1470    1923
 15   P1    1495    1375    1230    1060     910     755     672     576     487     414
 16   P1     348     294     250     215     180     153     135     114      95      79
 17   P1      60      52      46      41      37      33      29      25      21      17
 18   P1      13       9       5       1     0.0
 19   X             0.       1
 20   K       1      12                                                   1
 21   K1      ROUTE HYDROGRAPH THROUGH NEW PERRY DAM AND LAKE
 22   Y                                   1       1
 23   Y1      1                                                   -682.5      -1
 24   Y4  682.5     683     684     685     686     687     688     689     690     692
 25   Y4    695     700
 26   Y5    0.0      48     242     520    1019    1701    2518    5229    9523   21080
 27   Y5  43928   93136
 28   Y3      0    17.5    35.0    62.5   109.0   148.0   515.0
 29   Y2    673     680   682.5     685     688     690     700
 30   Y3  682.5
 31   Y0    688
 32   K       0      12                                                   1
 33   K1      INPUT INDEX PRECIPITATION AND RATIOS, INPUT SCS UNIT HYDROGRAPH, OLD DAM
 34   M       1      -1    0.12            0.12     1.0
 35   P             24.4     100     120     130
 36   T                                                     1.00    0.08
 37   L      11
 38   P1     0.0     208     387     192      85      35      16      10       4       1
 39   P1     0.0
 40   X             0.       1
 41   K       2      12                                                   1
 42   K1      ADD UPSTREAM FLOWS TO DOWNSTREAM HYDROGRAPH
 43   K       1      12                                   2
 44   K1      ROUTE COMBINED HYDROGRAPHS THROUGH OLD PERRY CITY DAM AND LAKE
 45   Y                                   1       1
 46   Y1      1                                                   -676.4      -1
 47   Y4  676.4   677.9   679.4   680.9   682.1   683.0   683.5   684.9   686.3   687.8
 48   Y5    0.0     884    1015    2415    3955    5400    7026   15337   26473   42044
 49   Y3    0.0     4.5    21.0    41.0    60.6   125.4   191.4   408.4
 50   Y2    667     670     673     675     678.4   680     683     690
```

91	95	676.0
92	97	683
93	K	99

INFLOW PMF AND ONE-HALF PMF

HYDROGRAPH COMPUTATION FOR NEW PERRY CITY DAM

PREVIEW OF SEQUENCE OF STREAM NETWORK CALCULATIONS

RUNOFF HYDROGRAPH AT	12
ROUTE HYDROGRAPH TO	12
RUNOFF HYDROGRAPH AT	12
COMBINE 2 HYDROGRAPHS AT	12
ROUTE HYDROGRAPH TO	12
END OF NETWORK	

```
**********************************
FLOOD HYDROGRAPH PACKAGE (HEC-1)
DAM SAFETY VERSION      JULY 1978
  LAST MODIFICATION  21 AUG 78
**********************************

RUN  DATE= 78/11/28.
     TIME= 13.42.25.


                    DAM SAFETY INSPECTION - MISSOURI
                          PERRY CITY DAM
              PMF AND 50 PERCENT PMF DETERMINATION AND ROUTING

                          JOB SPECIFICATION
        NQ     NHR    NMIN    IDAY     IHR    IMIN   METRC    IPLT    IPRT   NSTAN
       300      0       5       0       0       0       0       0       0       0
                             JOPER     NWT   LROPT   TRACE
                                 5       0       0       0

                    MULTI-PLAN ANALYSES TO BE PERFORMED
                      NPLAN= 1 NRTIO= 2 LRTIO= 1
              RTIOS=  1.00    .50


**********      **********      **********      **********      **********

                          SUB-AREA RUNOFF COMPUTATION

              INPUT INDEX PRECIPITATION AND RATIOS, INPUT SCS UNIT HY
                    ISTAQ   ICOMP   IECON   ITAPE    JPLT    JPRT   INAME  ISTAGE   IAUTO
                       12       0       0       0       0       0       1       0       0

                              HYDROGRAPH DATA
        IHYDG    IUHG   TAREA    SNAP   TRSDA   TRSPC   RATIO   ISNOW   ISAME   LOCAL
            1      -1    2.36    0.00    2.36    1.00   0.000       0       0       0

                              PRECIP DATA
                    SPFE     P6S      R6     R12     R24     R48     R72     R96
                    0.00   24.40  100.00  120.00  130.00    0.00    0.00    0.00

                              LOSS DATA
        LROPT   STRKR   DLTKR   RTIOL   ERAIN   STRKS   RTIOK   STRTL   CNSTL   ALSMX   RTIMP
            0    0.00    0.00    1.00    0.00    0.00    1.00    1.00     .08    0.00    0.00

                        GIVEN UNIT GRAPH, NUMBD=  45
        0.      23.     130.    280.    505.    840.   1040.   1310.   1470.   1583.
     1664.    1378.    1230.   1060.    910.    755.    672.    576.    487.    414.
      348.     294.     250.    215.    180.    153.    135.    114.     95.     77.
       60.      52.      46.     41.     37.     33.     29.     25.     21.     17.
       13.       9.       5.      1.      0.
              UNIT GRAPH TOTALS  18348. CFS OR 1.01 INCHES OVER THE AREA

                              RECESSION DATA
                    RTIOW=    0.00    QRCSN=    0.00    RTIOR= 1.00

                          END-OF-PERIOD FLOW
```

MO.DA	HR.MN	PERIOD	RAIN	EXCS	LOSS	COMP Q	MO.DA	HR.MN	PERIOD	RAIN	EXCS	LOSS	COMP Q
1.01	.05	1	.01	0.00	.01	0.	1.01	12.35	151	.20	.20	.01	1913.
1.01	.10	2	.01	0.00	.01	0.	1.01	12.40	152	.20	.20	.01	1951.
1.01	.15	3	.01	0.00	.01	0.	1.01	12.45	153	.20	.20	.01	1990.
1.01	.20	4	.01	0.00	.01	0.	1.01	12.50	154	.20	.20	.01	2096.
1.01	.25	5	.01	0.00	.01	0.	1.01	12.55	155	.20	.20	.01	2289.
1.01	.30	6	.01	0.00	.01	0.	1.01	13.00	156	.20	.20	.01	2486.
1.01	.35	7	.01	0.00	.01	0.	1.01	13.05	157	.24	.24	.01	2683.
1.01	.40	8	.01	0.00	.01	0.	1.01	13.10	158	.24	.24	.01	2787.
1.01	.45	9	.01	0.00	.01	0.	1.01	13.15	159	.24	.24	.01	2926.
1.01	.50	10	.01	0.00	.01	0.	1.01	13.20	160	.24	.24	.01	3040.
1.01	.55	11	.01	0.00	.01	0.	1.01	13.25	161	.24	.24	.01	3151.
1.01	1.00	12	.01	0.00	.01	0.	1.01	13.30	162	.24	.24	.01	3263.
1.01	1.05	13	.01	0.00	.01	0.	1.01	13.35	163	.24	.24	.01	3374.
1.01	1.10	14	.01	0.00	.01	0.	1.01	13.40	164	.24	.24	.01	3483.
1.01	1.15	15	.01	0.00	.01	0.	1.01	13.45	165	.24	.24	.01	3590.
1.01	1.20	16	.01	0.00	.01	0.	1.01	13.50	166	.24	.24	.01	3692.
1.01	1.25	17	.01	0.00	.01	0.	1.01	13.55	167	.24	.24	.01	3787.
1.01	1.30	18	.01	0.00	.01	0.	1.01	14.00	168	.24	.24	.01	3872.
1.01	1.35	19	.01	0.00	.01	0.	1.01	14.05	169	.31	.30	.01	3946.
1.01	1.40	20	.01	0.00	.01	0.	1.01	14.10	170	.31	.30	.01	4011.
1.01	1.45	21	.01	0.00	.01	0.	1.01	14.15	171	.31	.30	.01	4075.
1.01	1.50	22	.01	0.00	.01	0.	1.01	14.20	172	.31	.30	.01	4138.
1.01	1.55	23	.01	0.00	.01	0.	1.01	14.25	173	.31	.30	.01	4204.
1.01	2.00	24	.01	0.00	.01	0.	1.01	14.30	174	.31	.30	.01	4294.
1.01	2.05	25	.01	0.00	.01	0.	1.01	14.35	175	.31	.30	.01	4388.
1.01	2.10	26	.01	0.00	.01	0.	1.01	14.40	176	.31	.30	.01	4492.
1.01	2.15	27	.01	0.00	.01	0.	1.01	14.45	177	.31	.30	.01	4602.
1.01	2.20	28	.01	0.00	.01	0.	1.01	14.50	178	.31	.30	.01	4713.
1.01	2.25	29	.01	0.00	.01	0.	1.01	14.55	179	.31	.30	.01	4816.
1.01	2.30	30	.01	0.00	.01	0.	1.01	15.00	180	.31	.30	.01	4916.
1.01	2.35	31	.01	0.00	.01	0.	1.01	15.05	181	.14	.10	.01	5003.
1.01	2.40	32	.01	0.00	.01	0.	1.01	15.10	182	.37	.36	.01	5078.
1.01	2.45	33	.01	0.00	.01	0.	1.01	15.15	183	.37	.36	.01	5127.
1.01	2.50	34	.01	0.00	.01	0.	1.01	15.20	184	.96	.95	.01	5170.
1.01	2.55	35	.01	0.00	.01	0.	1.01	15.25	185	.65	.64	.01	5215.
1.01	3.00	36	.01	0.00	.01	0.	1.01	15.30	186	1.58	1.57	.01	5272.
1.01	3.05	37	.01	0.00	.01	0.	1.01	15.35	187	2.60	2.59	.01	5452.
1.01	3.10	38	.01	0.00	.01	0.	1.01	15.40	188	1.02	1.01	.01	5742.
1.01	3.15	39	.01	0.00	.01	0.	1.01	15.45	189	.65	.64	.01	6401.
1.01	3.20	40	.01	0.00	.01	0.	1.01	15.50	190	.96	.95	.01	7331.
1.01	3.25	41	.01	0.00	.01	0.	1.01	15.55	191	.37	.36	.01	8508.
1.01	3.30	42	.01	0.00	.01	0.	1.01	16.00	192	.37	.36	.01	10070.
1.01	3.35	43	.01	0.00	.01	0.	1.01	16.05	193	.28	.28	.01	11574.
1.01	3.40	44	.01	0.00	.01	0.	1.01	16.10	194	.28	.28	.01	12773.
1.01	3.45	45	.01	0.00	.01	0.	1.01	16.15	195	.28	.28	.01	13828.
1.01	3.50	46	.01	0.00	.01	0.	1.01	16.20	196	.28	.28	.01	14821.
1.01	3.55	47	.01	0.00	.01	0.	1.01	16.25	197	.28	.28	.01	[illegible]
1.01	4.00	48	.01	0.00	.01	0.	1.01	16.30	198	.28	.28	.01	[illegible]
1.01	4.05	49	.01	0.00	.01	0.	1.01	16.35	199	.28	.28	.01	[illegible]
1.01	4.10	50	.01	0.00	.01	0.	1.01	16.40	200	.28	.28	.01	[illegible]
1.01	4.15	51	.01	0.00	.01	0.	1.01	16.45	201	.28	.28	.01	[illegible]
1.01	4.20	52	.01	0.00	.01	0.	1.01	16.50	202	.28	.28	.01	[illegible]
1.01	4.25	53	.01	0.00	.01	0.	1.01	16.55	203	.28	.28	.01	[illegible]
1.01	4.30	54	.01	0.00	.01	0.	1.01	17.00	204	.28	.28	.01	[illegible]
1.01	4.35	55	.01	0.00	.01	0.	1.01	17.05	205	.22	.22	.01	[illegible]
1.01	4.40	56	.01	0.00	.01	0.	1.01	17.10	206	.22	.22	.01	[illegible]
1.01	4.45	57	.01	0.00	.01	0.	1.01	17.15	207	.22	.22	.01	[illegible]
1.01	4.50	58	.01	0.00	.01	0.	1.01	17.20	208	.22	.22	.01	[illegible]

1.01	4.55	59	.01	0.00	.01	0.	1.01	17.05	209	.02	.22	.01	[illegible]
1.01	4.60	60	.01	0.00	.01	0.	1.01	17.30	210	.22	.22	.01	[illegible]
1.01	5.05	61	.01	0.00	.01	0.	1.01	17.35	211	.22	.22	.01	[illegible]
1.01	5.10	62	.01	0.00	.01	0.	1.01	17.40	212	.22	.22	.01	[illegible]
1.01	5.15	63	.01	0.00	.01	0.	1.01	17.45	213	.22	.22	.01	[illegible]
1.01	5.20	64	.01	0.00	.01	0.	1.01	17.50	214	.22	.22	.01	[illegible]
1.01	5.25	65	.01	0.00	.01	0.	1.01	17.55	215	.22	.22	.01	[illegible]
1.01	5.30	66	.01	0.00	.01	0.	1.01	18.00	216	.22	.22	.01	[illegible]
1.01	5.35	67	.01	0.00	.01	0.	1.01	18.05	217	.02	.01	.01	[illegible]
1.01	5.40	68	.01	0.00	.01	0.	1.01	18.10	218	.02	.01	.01	4606.
1.01	5.45	69	.01	0.00	.01	0.	1.01	18.15	219	.02	.01	.01	4560.
1.01	5.50	70	.01	0.00	.01	0.	1.01	18.20	220	.02	.01	.01	[illegible]
1.01	5.55	71	.01	0.00	.01	0.	1.01	18.25	221	.02	.01	.01	[illegible]
1.01	6.00	72	.01	0.00	.01	0.	1.01	18.30	222	.02	.01	.01	4010.
1.01	6.05	73	.07	.04	.03	0.	1.01	18.35	223	.02	.01	.01	[illegible]
1.01	6.10	74	.07	.06	.01	1.	1.01	18.40	224	.02	.01	.01	3427.
1.01	6.15	75	.07	.06	.01	7.	1.01	18.45	225	.02	.01	.01	3083.
1.01	6.20	76	.07	.06	.01	20.	1.01	18.50	226	.02	.01	.01	2732.
1.01	6.25	77	.07	.06	.01	46.	1.01	18.55	227	.02	.01	.01	2389.
1.01	6.30	78	.07	.06	.01	90.	1.01	19.00	228	.02	.01	.01	2074.
1.01	6.35	79	.07	.06	.01	152.	1.01	19.05	229	.02	.01	.01	[illegible]
1.01	6.40	80	.07	.06	.01	227.	1.01	19.10	230	.02	.01	.01	1550.
1.01	6.45	81	.07	.06	.01	313.	1.01	19.15	231	.02	.01	.01	1348.
1.01	6.50	82	.07	.06	.01	405.	1.01	19.20	232	.02	.01	.01	1184.
1.01	6.55	83	.07	.06	.01	497.	1.01	19.25	233	.02	.01	.01	1030.
1.01	7.00	84	.07	.06	.01	584.	1.01	19.30	234	.02	.01	.01	916.
1.01	7.05	85	.07	.06	.01	662.	1.01	19.35	235	.02	.01	.01	813.
1.01	7.10	86	.07	.06	.01	731.	1.01	19.40	236	.02	.01	.01	726.
1.01	7.15	87	.07	.06	.01	790.	1.01	19.45	237	.02	.01	.01	652.
1.01	7.20	88	.07	.06	.01	839.	1.01	19.50	238	.02	.01	.01	596.
1.01	7.25	89	.07	.06	.01	882.	1.01	19.55	239	.02	.01	.01	537.
1.01	7.30	90	.07	.06	.01	919.	1.01	20.00	240	.02	.01	.01	491.
1.01	7.35	91	.07	.06	.01	951.	1.01	20.05	241	.02	.01	.01	453.
1.01	7.40	92	.07	.06	.01	978.	1.01	20.10	242	.02	.01	.01	420.
1.01	7.45	93	.07	.06	.01	1001.	1.01	20.15	243	.02	.01	.01	391.
1.01	7.50	94	.07	.06	.01	1020.	1.01	20.20	244	.02	.01	.01	367.
1.01	7.55	95	.07	.06	.01	1036.	1.01	20.25	245	.02	.01	.01	347.
1.01	8.00	96	.07	.06	.01	1050.	1.01	20.30	246	.02	.01	.01	331.
1.01	8.05	97	.07	.06	.01	1062.	1.01	20.35	247	.02	.01	.01	316.
1.01	8.10	98	.07	.06	.01	1072.	1.01	20.40	248	.02	.01	.01	300.
1.01	8.15	99	.07	.06	.01	1080.	1.01	20.45	249	.02	.01	.01	290.
1.01	8.20	100	.07	.06	.01	1088.	1.01	20.50	250	.02	.01	.01	290.
1.01	8.25	101	.07	.06	.01	1094.	1.01	20.55	251	.02	.01	.01	283.
1.01	8.30	102	.07	.06	.01	1099.	1.01	21.00	252	.02	.01	.01	276.
1.01	8.35	103	.07	.06	.01	1103.	1.01	21.05	253	.02	.01	.01	[illegible]
1.01	8.40	104	.07	.06	.01	1106.	1.01	21.10	254	.02	.01	.01	265.
1.01	8.45	105	.07	.06	.01	1109.	1.01	21.15	255	.02	.01	.01	[illegible]
1.01	8.50	106	.07	.06	.01	1112.	1.01	21.20	256	.02	.01	.01	[illegible]
1.01	8.55	107	.07	.06	.01	1114.	1.01	21.25	257	.02	.01	.01	[illegible]
1.01	9.00	108	.07	.06	.01	1116.	1.01	21.30	258	.02	.01	.01	[illegible]
1.01	9.05	109	.07	.06	.01	1118.	1.01	21.35	259	.02	.01	.01	[illegible]
1.01	9.10	110	.07	.06	.01	1120.	1.01	21.40	260	.02	.01	.01	251.
1.01	9.15	111	.07	.06	.01	1121.	1.01	21.45	261	.02	.01	.01	[illegible]
1.01	9.20	112	.07	.06	.01	1122.	1.01	21.50	262	.02	.01	.01	[illegible]
1.01	9.25	113	.07	.06	.01	1123.	1.01	21.55	263	.02	.01	.01	[illegible]
1.01	9.30	114	.07	.06	.01	1124.	1.01	22.00	264	.02	.01	.01	[illegible]
1.01	9.35	115	.07	.06	.01	1124.	1.01	22.05	265	.02	.01	.01	[illegible]
1.01	9.40	116	.07	.06	.01	1124.	1.01	22.10	266	.02	.01	.01	[illegible]
1.01	9.45	117	.07	.06	.01	1124.	1.01	22.15	267	.02	.01	.01	[illegible]
1.01	9.50	118	.07	.06	.01	1124.	1.01	22.20	268	.02	.01	.01	[illegible]

1.01	9.55	119	.07	.06	.01	1124.	1.01	22.25	269	.02	.01	.01	251.
1.01	10.00	120	.07	.06	.01	1124.	1.01	22.30	270	.02	.01	.01	251.
1.01	10.05	121	.07	.06	.01	1124.	1.01	22.35	271	.02	.01	.01	251.
1.01	10.10	122	.07	.06	.01	1124.	1.01	22.40	272	.02	.01	.01	251.
1.01	10.15	123	.07	.06	.01	1124.	1.01	22.45	273	.02	.01	.01	251.
1.01	10.20	124	.07	.06	.01	1124.	1.01	22.50	274	.02	.01	.01	251.
1.01	10.25	125	.07	.06	.01	1124.	1.01	22.55	275	.02	.01	.01	251.
1.01	10.30	126	.07	.06	.01	1124.	1.01	23.00	276	.02	.01	.01	251.
1.01	10.35	127	.07	.06	.01	1124.	1.01	23.05	277	.02	.01	.01	251.
1.01	10.40	128	.07	.06	.01	1124.	1.01	23.10	278	.02	.01	.01	251.
1.01	10.45	129	.07	.06	.01	1124.	1.01	23.15	279	.02	.01	.01	251.
1.01	10.50	130	.07	.06	.01	1124.	1.01	23.20	280	.02	.01	.01	251.
1.01	10.55	131	.07	.06	.01	1124.	1.01	23.25	281	.02	.01	.01	251.
1.01	11.00	132	.07	.06	.01	1124.	1.01	23.30	282	.02	.01	.01	251.
1.01	11.05	133	.07	.06	.01	1124.	1.01	23.35	283	.02	.01	.01	251.
1.01	11.10	134	.07	.06	.01	1124.	1.01	23.40	284	.02	.01	.01	251.
1.01	11.15	135	.07	.06	.01	1124.	1.01	23.45	285	.02	.01	.01	251.
1.01	11.20	136	.07	.06	.01	1124.	1.01	23.50	286	.02	.01	.01	251.
1.01	11.25	137	.07	.06	.01	1124.	1.01	23.55	287	.02	.01	.01	251.
1.01	11.30	138	.07	.06	.01	1124.	1.02	0.00	288	.02	.01	.01	251.
1.01	11.35	139	.07	.06	.01	1124.	1.02	.05	289	0.00	0.00	0.00	251.
1.01	11.40	140	.07	.06	.01	1124.	1.02	.10	290	0.00	0.00	0.00	251.
1.01	11.45	141	.07	.06	.01	1124.	1.02	.15	291	0.00	0.00	0.00	249.
1.01	11.50	142	.07	.06	.01	1124.	1.02	.20	292	0.00	0.00	0.00	246.
1.01	11.55	143	.07	.06	.01	1124.	1.02	.25	293	0.00	0.00	0.00	239.
1.01	12.00	144	.07	.06	.01	1124.	1.02	.30	294	0.00	0.00	0.00	227.
1.01	12.05	145	.20	.20	.01	1124.	1.02	.35	295	0.00	0.00	0.00	208.
1.01	12.10	146	.20	.20	.01	1127.	1.02	.40	296	0.00	0.00	0.00	184.
1.01	12.15	147	.20	.20	.01	1145.	1.02	.45	297	0.00	0.00	0.00	170.
1.01	12.20	148	.20	.20	.01	1183.	1.02	.50	298	0.00	0.00	0.00	153.
1.01	12.25	149	.20	.20	.01	1251.	1.02	.55	299	0.00	0.00	0.00	133.
1.01	12.30	150	.20	.20	.01	1365.	1.02	1.00	300	0.00	0.00	0.00	114.
									SUM	31.72	29.28	2.44	538052.
										(806.)(	744.)(	62.)(	15236.87)

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	13521.	5906.	1868.	1794.	538052.
CMS	383.	167.	53.	51.	15236.
INCHES		23.28	29.46	29.46	29.46
MM		591.29	748.18	748.18	748.18
AC-FT		2929.	3706.	3706.	3706.
THOUS CU M		3612.	4571.	4571.	4571.

HYDROGRAPH AT STA 12 FOR PLAN 1, RTIO 1

0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	1.	7.	20.	46.	90.	152.	227.
313.	405.	497.	584.	662.	731.	790.	839.	882.	919.
991.	978.	1001.	1020.	1036.	1050.	1062.	1072.	1080.	1088.
1094.	1099.	1103.	1106.	1109.	1112.	1114.	1116.	1118.	1120.
1121.	1122.	1123.	1124.	1124.	1124.	1124.	1124.	1124.	1124.
1124.	1124.	1124.	1124.	1124.	1124.	1124.	1124.	1124.	1124.

1124.	1124.	1124.	1124.	1124.	1124.	1124.	1124.	1124.	1124.
1124.	1124.	1124.	1124.	1124.	1127.	1185.	1183.	1251.	1365.
1611.	1691.	1800.	2096.	2349.	2486.	2653.	2797.	2925.	3000.
3151.	3263.	3370.	3483.	3580.	3692.	3787.	3872.	3946.	4011.
4079.	4138.	4209.	4894.	4388.	4492.	4602.	4713.	4819.	4916.
5003.	5094.	5127.	5170.	5213.	5272.	5415.	5732.	6401.	7321.
8908.	10070.	11374.	12873.	13224.	13521.	13388.	12888.	12168.	11348.
10524.	9765.	9150.	8576.	8061.	7680.	7227.	6888.	6586.	6309.
6084.	5801.	5578.	5360.	5197.	4972.	4813.	4680.	4560.	4440.
4250.	4018.	3742.	3427.	3083.	2732.	2389.	2074.	1792.	1550.
1348.	1184.	1039.	918.	813.	726.	652.	590.	537.	491.
453.	420.	391.	367.	347.	331.	318.	308.	298.	289.
283.	276.	270.	265.	261.	257.	254.	253.	252.	251.
251.	251.	251.	251.	251.	251.	251.	251.	251.	251.
251.	251.	251.	251.	251.	251.	251.	251.	251.	251.
251.	251.	251.	251.	251.	251.	251.	251.	251.	251.
249.	246.	239.	227.	212.	194.	174.	153.	133.	114.

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	13521.	5906.	1868.	1794.	338052.
CMS	383.	167.	53.	51.	19236.
INCHES		23.28	29.46	29.46	29.46
MM		591.29	748.18	748.18	748.18
AC-FT		2929.	3706.	3706.	3706.
THOUS CU M		3612.	4571.	4571.	4571.

HYDROGRAPH AT STA 12 FOR PLAN 1, RTIO 2

0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	3.	10.	23.	45.	76.	113.
157.	203.	249.	292.	331.	365.	395.	420.	441.	460.
475.	489.	500.	510.	518.	525.	531.	538.	540.	544.
547.	548.	551.	553.	555.	556.	557.	558.	559.	560.
561.	561.	562.	562.	562.	562.	562.	562.	562.	562.
562.	562.	562.	562.	562.	562.	562.	562.	562.	562.
562.	562.	562.	562.	562.	562.	562.	562.	562.	562.
562.	562.	562.	562.	562.	564.	573.	592.	626.	683.
797.	845.	945.	1048.	1150.	1243.	1326.	1399.	1465.	1520.
1576.	1632.	1687.	1742.	1795.	1846.	1893.	1936.	1973.	2006.
2037.	2069.	2104.	2147.	2194.	2246.	2301.	2356.	2410.	2458.
2501.	2537.	2563.	2585.	2606.	2636.	2708.	2876.	3200.	3666.
4209.	5035.	5687.	6237.	6612.	6761.	6694.	6484.	6084.	5574.
5202.	4882.	4575.	4288.	4031.	3810.	3613.	3444.	3294.	3155.
3022.	2901.	2789.	2680.	2578.	2486.	2406.	2343.	2280.	2211.
2129.	2009.	1871.	1713.	1541.	1366.	1195.	1037.	896.	775.
674.	598.	520.	458.	407.	363.	326.	295.	268.	246.
229.	210.	198.	184.	174.	165.	159.	154.	149.	145.
141.	138.	135.	132.	130.	129.	127.	126.	126.	126.
126.	126.	126.	126.	126.	126.	126.	126.	126.	126.
126.	126.	126.	126.	126.	126.	126.	126.	126.	126.
126.	126.	126.	126.	126.	126.	126.	126.	126.	126.
125.	123.	119.	114.	106.	97.	87.	77.	67.	57.

PMF HYDROGRAPH ROUTING

NEW PERRY CITY DAM

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                     PEAK    6-HOUR   24-HOUR   72-HOUR   TOTAL VOLUME
           CFS      6761.     2953.      934.      897.       269026.
           CMS       191.       84.       26.       25.         7618.
        INCHES                11.64     14.73     14.73         14.73
            MM               295.84    374.09    374.09        374.09
         AC-FT                1464.     1853.     1853.         1853.
     THOUS CU M               1805.     2285.     2285.         2285.

     **********    **********    **********    **********    **********

                                 HYDROGRAPH ROUTING

            ROUTE HYDROGRAPH THROUGH LEW PERRY DAM AND LAKE
                   ISTAQ   ICOMP   IECON   ITAPE    JPLT    JPRT   INAME  ISTAGE   IAUTO
                      12       1       0       0       0       0       1       0       0
                                        ROUTING DATA
          QLOSS    CLOSS     AVG    IRES   ISAME    IOPT    IPMP            LSTR
            0.0    0.000    0.00       1       1       0       0               0

                   NSTPS   NSTDL     LAG   AMSKK       X     TSK   STORA  ISPRAT
                       1       0       0   0.000   0.000   0.000   -683.      -1

  STAGE     682.5    683.0    684.0    685.0    686.0    687.0    688.0    689.0    690.0    692.0
            695.0    700.0

   FLOW        0.      44.     242.     520.    1019.    1701.    2516.    5229.    9985.   21080.
           43924.   93136.

CAPACITY=      0.      18.      35.      63.     109.     148.     513.

ELEVATION=   673.     680.     683.     685.     688.     690.     700.

                  CREL   SPWID   COQW    EXPW   ELEVL    COQL   CAREA    EXPL
                 682.5     0.0    0.0     0.0     0.0     0.0     0.0     0.0

                                    DAM DATA
                          TOPEL    COQD    EXPD   DAMWID
                          688.0     0.0     0.0      0.

                     STATION      12, PLAN 1, RATIO 1

                     END-OF-PERIOD HYDROGRAPH ORDINATES

                                      OUTFLOW
        0.       0.       0.       0.       0.       0.       0.       0.       0.       0.
        0.       0.       0.       0.       0.       0.       0.       0.       0.       0.
        0.       0.       0.       0.       0.       0.       0.       0.       0.       0.
        0.       0.       0.       0.       0.       0.       0.       0.       0.       0.
        0.       0.       0.       0.       0.       0.       0.       0.       0.       0.
        0.       0.       0.       0.       0.       0.       0.       0.       0.       0.
        0.       0.       0.       0.       0.       0.       0.       0.       0.       0.
        0.       0.       0.       0.       0.       0.       0.       0.       0.       0.
        0.       0.       0.       0.       0.       1.       3.       7.      13.  [illegible]
       38.      65.     109.     159.     212.     278.     359.     428.     498.  [illegible]
      645.     709.     765.     814.     856.     894.     926.     954.     978.  [illegible]
     1010.    1038.    1058.    1068.    1078.    1087.    1094.    1099.    1104.  [illegible]
     1111.    1114.    1116.    1118.    1120.    1121.    1122.    1122.    1123.  [illegible]
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 1124.   1124.   1124.   1124.   1124.   1124.   1124.   1124.   1124.   1124.
 1124.   1124.   1124.   1124.   1124.   1124.   1124.   1124.   1124.   1124.
 1124.   1124.   1124.   1126.   1124.   1125.   1128.   1137.   1139.   1149.
 1261.   1391.   1467.   1605.   1771.   1962.   2148.   2329.   2489.   2779.
 2984.   3129.   3251.   3366.   3476.   3583.   3884.   3777.   3862.   3937.
 4005.   4170.   4136.   4219.   4294.   4388.   4490.   4597.   4709.   4800.
 4984.   4989.   5000.   5116.   5104.   5213.   5320.   5547.   6003.   6777.
 7797.   9123.  10324.  11493.  12436.  13097.  13349.  13200.  12786.  10043.
11262.  10473.   9797.   9038.   8417.   7924.   7492.   7117.   6790.   6695.
 6220.   5964.   5730.   5506.   5293.   5129.   4975.   4829.   4695.   4963.
 4016.   4233.   4004.   3732.   3423.   3089.   2747.   2467.   2303.   2109.
 1907.   1710.   1551.   1401.   1260.   1131.   1016.    937.    862.    793.
  729.    671.    618.    570.    528.    496.    468.    444.    421.    401.
  382.    366.    351.    338.    326.    315.    306.    298.    290.    284.
  279.    275.    271.    268.    265.    263.    261.    260.    258.    257.
  256.    255.    255.    254.    254.    253.    253.    253.    253.    252.
  252.    252.    252.    252.    252.    252.    252.    252.    252.    252.
  251.    251.    249.    247.    242.    238.    232.    224.    215.    204.

                                 STORAGE
   35.     35.     35.     35.     35.     35.     35.     35.     35.     35.
   35.     35.     35.     35.     35.     35.     35.     35.     35.     35.
   35.     35.     35.     35.     35.     35.     35.     35.     35.     35.
   35.     35.     35.     35.     35.     35.     35.     35.     35.     35.
   35.     35.     35.     35.     35.     35.     35.     35.     35.     35.
   35.     35.     35.     35.     35.     35.     35.     35.     35.     35.
   35.     35.     35.     35.     35.     35.     35.     35.     35.     35.
   35.     35.     35.     35.     35.     35.     35.     36.     37.     38.
   39.     41.     44.     47.     50.     53.     56.     59.     62.     64.
   66.     68.     70.     72.     73.     74.     75.     76.     77.     77.
   78.     78.     79.     79.     79.     80.     80.     80.     80.     80.
   80.     80.     80.     80.     80.     80.     80.     80.     80.     80.
   80.     80.     80.     80.     80.     80.     80.     80.     80.     80.
   80.     80.     80.     80.     80.     80.     80.     80.     80.     80.
   80.     80.     80.     80.     80.     80.     80.     81.     81.     82.
   84.     86.     88.     91.     95.     98.    102.    105.    108.    111.
  112.    113.    114.    115.    116.    117.    117.    118.    119.    119.
  120.    120.    121.    121.    122.    122.    123.    124.    125.    125.
  126.    127.    127.    128.    128.    128.    129.    130.    132.    135.
  140.    146.    153.    160.    166.    171.    172.    171.    168.    164.
  159.    154.    149.    146.    143.    141.    139.    137.    136.    134.
  133.    132.    131.    130.    129.    128.    127.    126.    125.    124.
  123.    121.    120.    118.    116.    113.    111.    108.    105.    101.
   97.     94.     90.     87.     83.     81.     78.     75.     73.     71.
   69.     67.     66.     64.     63.     62.     60.     59.     59.     58.
   57.     56.     56.     55.     55.     54.     54.     54.     53.     53.
   53.     53.     53.     53.     52.     52.     52.     52.     52.     52.
   52.     52.     52.     52.     52.     52.     52.     52.     52.     52.
   52.     52.     52.     52.     52.     52.     52.     52.     52.     52.
   52.     52.     52.     52.     52.     51.     51.     50.     50.     49.

                                  STAGE
  682.5   682.5   682.5   682.5   682.5   682.5   682.5   682.5   682.5   682.5
  682.5   682.5   682.5   682.5   682.5   682.5   682.5   682.5   682.5   682.5
  682.5   682.5   682.5   682.5   682.5   682.5   682.5   682.5   682.5   682.5
  682.5   682.5   682.5   682.5   682.5   682.5   682.5   682.5   682.5   682.5
  682.5   682.5   682.5   682.5   682.5   682.5   682.5   682.5   682.5   682.5
  682.5   682.5   682.5   682.5   682.5   682.5   682.5   682.5   682.5   682.5
  682.5   682.5   682.5   682.5   682.5   682.5   682.5   682.5   682.5   682.5
  682.5   682.5   682.5   682.5   682.5   682.5   682.5   682.6   682.6   682.7
```

INFLOW PMF AND ONE-HALF PMF

OLD PERRY CITY DAM

(Local Flows)

```
      682.9    683.1    683.1    683.5    683.8    684.1    684.4    684.7    684.9    685.1
      685.3    685.4    685.5    685.6    685.7    685.7    685.8    685.9    686.0    686.0
      686.0    686.0    686.1    686.1    686.1    686.1    686.1    686.1    686.1    686.1
      686.1    686.1    686.1    686.1    686.1    686.1    686.2    686.2    686.2    686.2
      686.2    686.2    686.2    686.2    686.2    686.2    686.2    686.2    686.2    686.2
      686.2    686.2    686.2    686.2    686.2    686.2    686.2    686.2    686.2    686.2
      686.2    686.2    686.2    686.2    686.2    686.2    686.2    686.2    686.2    686.3
      686.4    686.5    686.7    686.9    687.1    687.3    687.5    687.8    688.0    688.1
      688.2    688.2    688.3    688.3    688.4    688.4    688.4    688.5    688.5    688.5
      688.5    688.6    688.6    688.6    688.7    688.7    688.7    688.8    688.8    688.8
      688.9    688.9    688.9    689.0    689.0    689.0    689.0    689.1    689.2    689.4
      689.6    689.9    690.1    690.3    690.5    690.6    690.7    690.6    690.6    690.4
      690.3    690.2    690.0    689.9    689.7    689.6    689.5    689.4    689.3    689.3
      689.2    689.2    689.1    689.1    689.0    689.0    688.9    688.9    688.8    688.8
      688.7    688.6    688.5    688.4    688.3    688.2    688.1    687.9    687.7    687.5
      687.3    687.0    686.8    686.6    686.4    686.2    686.0    685.8    685.7    685.5
      685.4    685.3    685.2    685.1    685.0    684.9    684.8    684.7    684.6    684.6
      684.5    684.4    684.4    684.3    684.3    684.3    684.2    684.2    684.2    684.2
      684.1    684.1    684.1    684.1    684.1    684.1    684.1    684.1    684.1    684.1
      684.1    684.0    684.0    684.0    684.0    684.0    684.0    684.0    684.0    684.0
      684.0    684.0    684.0    684.0    684.0    684.0    684.0    684.0    684.0    684.0
      684.0    684.0    684.0    684.0    684.0    684.0    683.9    683.9    683.9    683.8

 PEAK OUTFLOW IS     13349. AT TIME  16.42 HOURS

                              PEAK    6-HOUR    24-HOUR   72-HOUR   TOTAL VOLUME
                      CFS    13349.    5888.     1861.     1786.      535936.
                      CMS      378.     167.       53.       51.       15176.
                   INCHES              23.21     29.34     29.34        29.34
                       MM             589.53    745.24    745.24       745.24
                    AC-FT              2920.     3691.     3691.        3691.
                THOUS CU M             3602.     4553.     4553.        4553.

                                   STATION     12, PLAN 1, RATIO 2

                                 END-OF-PERIOD HYDROGRAPH ORDINATES

                                              OUTFLOW
         0.       0.       0.       0.       0.       0.       0.       0.       0.       0.
         0.       0.       0.       0.       0.       0.       0.       0.       0.       0.
         0.       0.       0.       0.       0.       0.       0.       0.       0.       0.
         0.       0.       0.       0.       0.       0.       0.       0.       0.       0.
         0.       0.       0.       0.       0.       0.       0.       0.       0.       0.
         0.       0.       0.       0.       0.       0.       0.       0.       0.       0.
         0.       0.       0.       0.       0.       0.       0.       0.       0.       0.
         0.       0.       0.       0.       0.       1.       1.       3.       7.      12.
        19.      28.      40.      58.      87.     117.     147.     177.     206.     234.
       288.     323.     343.     361.     385.     407.     426.     444.     459.     472.
       484.     494.     503.     511.     518.     525.     531.     536.     541.     545.
       548.     550.     553.     554.     556.     557.     558.     559.     560.     560.
       561.     561.     561.     561.     561.     562.     562.     562.     562.     562.
       562.     562.     562.     562.     562.     562.     562.     562.     562.     562.
       562.     562.     562.     562.     562.     562.     563.     567.     575.     591.
       617.     664.     708.     761.     828.     902.     978.    1060.    1142.    1229.
      1327.    1400.    1468.    1533.    1595.    1654.    1713.    1774.    1830.    1878.
      1922.    1962.    2000.    2039.    2079.    2122.    2169.    2218.    2268.    2319.
      2368.    2415.    2450.    2492.    2538.    2590.    2643.    2739.    2933.    3297.
```

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 3727.    4336.    5008.    5754.    6332.    6698.    6713.    6593.    6304.    [illegible]
 5533.    5190.    4880.    4590.    4311.    4058.    3834.    3036.    3404.    [illegible]
 3108.    3034.    2912.    2747.    2888.    2587.    2508.    2461.    2419.    [illegible]
 2305.    2232.    2143.    2035.    1910.    1770.    1631.    1496.    1356.    1219.
 1089.     981.     896.     815.     739.     668.     603.     545.     498.     459.
  424.     391.     361.     333.     308.     286.     266.     249.     236.     226.
  216.     207.     199.     192.     185.     179.     173.     167.     163.     159.
  155.     151.     148.     146.     144.     142.     140.     138.     137.     135.
  139.     133.     132.     132.     131.     130.     130.     129.     129.     129.
  128.     128.     128.     127.     127.     127.     127.     127.     127.     127.
  126.     126.     126.     124.     123.     120.     117.     113.     108.     103.
                                  STORAGE
   35.      35.      35.      35.      35.      35.      35.      35.      35.      35.
   35.      35.      35.      35.      35.      35.      35.      35.      35.      35.
   35.      35.      35.      35.      35.      35.      35.      35.      35.      35.
   35.      35.      35.      35.      35.      35.      35.      35.      35.      35.
   35.      35.      35.      35.      35.      35.      35.      35.      35.      35.
   35.      35.      35.      35.      35.      35.      35.      35.      35.      35.
   35.      35.      35.      35.      35.      35.      35.      35.      35.      35.
   35.      35.      35.      35.      35.      35.      35.      35.      36.      38.
   37.      38.      40.      41.      43.      44.      46.      48.      49.      51.
   53.      54.      55.      56.      57.      58.      59.      59.      60.      61.
   61.      61.      62.      62.      62.      63.      63.      63.      63.      63.
   63.      63.      64.      64.      64.      64.      64.      64.      64.      64.
   64.      64.      64.      64.      64.      64.      64.      64.      64.      64.
   64.      64.      64.      64.      64.      64.      64.      64.      64.      64.
   64.      64.      64.      64.      64.      64.      64.      64.      64.      65.
   66.      67.      68.      70.      72.      74.      77.      79.      81.      83.
   85.      87.      88.      90.      91.      92.      94.      95.      96.      97.
   98.      98.      99.     100.     101.     102.     102.     103.     104.     105.
  106.     107.     108.     109.     109.     110.     110.     111.     112.     114.
  118.     122.     127.     131.     134.     135.     135.     135.     133.     132.
  130.     128.     126.     124.     122.     120.     118.     117.     116.     115.
  114.     113.     112.     111.     110.     110.     109.     108.     107.     106.
  105.     104.     102.     100.      97.      95.      92.      89.      86.      83.
   80.      77.      74.      72.      69.      67.      65.      63.      62.      60.
   59.      57.      56.      55.      54.      53.      52.      52.      51.      51.
   50.      50.      49.      49.      48.      48.      48.      47.      47.      48.
   47.      46.      46.      46.      46.      46.      46.      46.      46.      45.
   45.      45.      45.      45.      45.      45.      45.      45.      45.      45.
   45.      45.      45.      45.      45.      45.      45.      45.      45.      45.
   45.      45.      45.      45.      45.      45.      44.      44.      44.      44.
                                  STAGE
  682.5    682.5    682.5    682.5    682.5    682.5    682.5    682.5    682.5    682.5
  682.5    682.5    682.5    682.5    682.5    682.5    682.5    682.5    682.5    682.5
  682.5    682.5    682.5    682.5    682.5    682.5    682.5    682.5    682.5    682.5
  682.5    682.5    682.5    682.5    682.5    682.5    682.5    682.5    682.5    682.5
  682.5    682.5    682.5    682.5    682.5    682.5    682.5    682.5    682.5    682.5
  682.5    682.5    682.5    682.5    682.5    682.5    682.5    682.5    682.5    682.5
  682.5    682.5    682.5    682.5    682.5    682.5    682.5    682.5    682.5    682.5
  682.5    682.5    682.5    682.5    682.5    682.5    682.5    682.5    682.6    682.8
  682.7    682.8    682.9    683.1    683.2    683.4    683.5    683.7    683.8    684.0
  684.1    684.2    684.3    684.4    684.5    684.6    684.7    684.7    684.8    684.9
  684.9    684.9    684.9    685.0    685.0    685.0    685.0    685.0    685.0    685.0
  685.1    685.1    685.1    685.1    685.1    685.1    685.1    685.1    685.1    685.1
  685.1    685.1    685.1    685.1    685.1    685.1    685.1    685.1    685.1    685.1
  685.1    685.1    685.1    685.1    685.1    685.1    685.1    685.1    685.1    685.1
  685.1    685.1    685.1    685.1    685.1    685.1    685.1    685.1    685.1    685.1
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AD-A106 595 PRC CONSOER TOWNSEND INC ST LOUIS MO F/G 13/13
NATIONAL DAM SAFETY PROGRAM. PERRY CITY DAM (MO 10675), MISSISS--ETC(U)
JAN 79 W G SHIFFRIN DACW43-78-C-0160

UNCLASSIFIED NL

2 OF 2
AD A
106595

END
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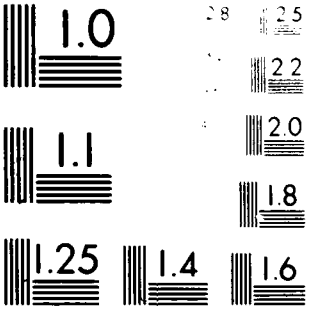


ONE-HALF PMF FLOOD ROUTING

NEW PERRY CITY DAM

685.2	685.3	685.4	685.5	685.6	685.8	685.9	686.1	686.2	686.3
686.5	686.6	686.7	686.8	686.8	686.9	687.0	687.1	687.2	687.3
687.3	687.3	687.4	687.4	687.5	687.5	687.6	687.6	687.7	687.8
687.8	687.8	687.9	688.0	688.0	688.0	688.0	688.1	688.2	688.2
688.2	688.7	688.9	689.1	689.3	689.3	689.3	689.3	689.3	689.2
689.1	689.0	688.9	688.8	688.7	688.6	688.5	688.4	688.3	688.3
688.2	688.2	688.1	688.1	688.1	688.0	688.0	687.9	687.9	687.8
687.7	687.7	687.5	687.4	687.3	687.1	686.9	686.7	686.5	686.3
686.1	685.9	685.8	685.6	685.4	685.3	685.2	685.1	684.9	684.8
684.7	684.5	684.4	684.3	684.2	684.2	684.1	684.0	684.0	683.9
683.9	683.8	683.8	683.7	683.7	683.7	683.6	683.6	683.6	683.6
683.6	683.5	683.5	683.5	683.5	683.5	683.5	683.5	683.5	683.5
683.4	683.4	683.4	683.4	683.4	683.4	683.4	683.4	683.4	683.4
683.4	683.4	683.4	683.4	683.4	683.4	683.4	683.4	683.4	683.4
683.4	683.4	683.4	683.4	683.4	683.4	683.4	683.3	683.3	683.3

PEAK OUTFLOW IS 6713. AT TIME 16.42 HOURS

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	6713.	2934.	930.	844.	267783.
CMS	190.	83.	26.	25.	7583.
INCHES		11.56	14.66	14.66	14.66
MM		293.72	372.36	372.36	372.36
AC-FT		1455.	1848.	1848.	1848.
THOUS CU M		1794.	2275.	2275.	2275.

********** ********** ********** ********** **********

SUB-AREA RUNOFF COMPUTATION

INPUT INDEX PRECIPITATION AND RATIOS, INPUT SCS UNIT HY

ISTAQ	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME	ISTAGE	IAUTO
12	0	0	0	0	0	1	0	0

HYDROGRAPH DATA

IHYDG	IUHG	TAREA	SNAP	TRSDA	TRSPC	RATIO	ISNOW	ISAME	LOCAL
1	-1	.12	0.00	.12	1.00	0.000	0	0	0

PRECIP DATA

SPFE	PMS	R6	R12	R24	R48	R72	R96
0.00	28.40	100.00	120.00	130.00	0.00	0.00	0.00

LOSS DATA

LROPT	STRTQ	STRTL	RTIOL	ERAIN	STRKS	RTIOK	STRTL	CNSTL	ALSMX	RTIMP
0	0.00	0.00	1.00	0.00	0.00	1.00	1.00	.00	0.00	0.00

GIVEN UNIT GRAPH, NUHG= 11

0.	200.	387.	192.	85.	35.	16.	10.	4.	4.
4.									

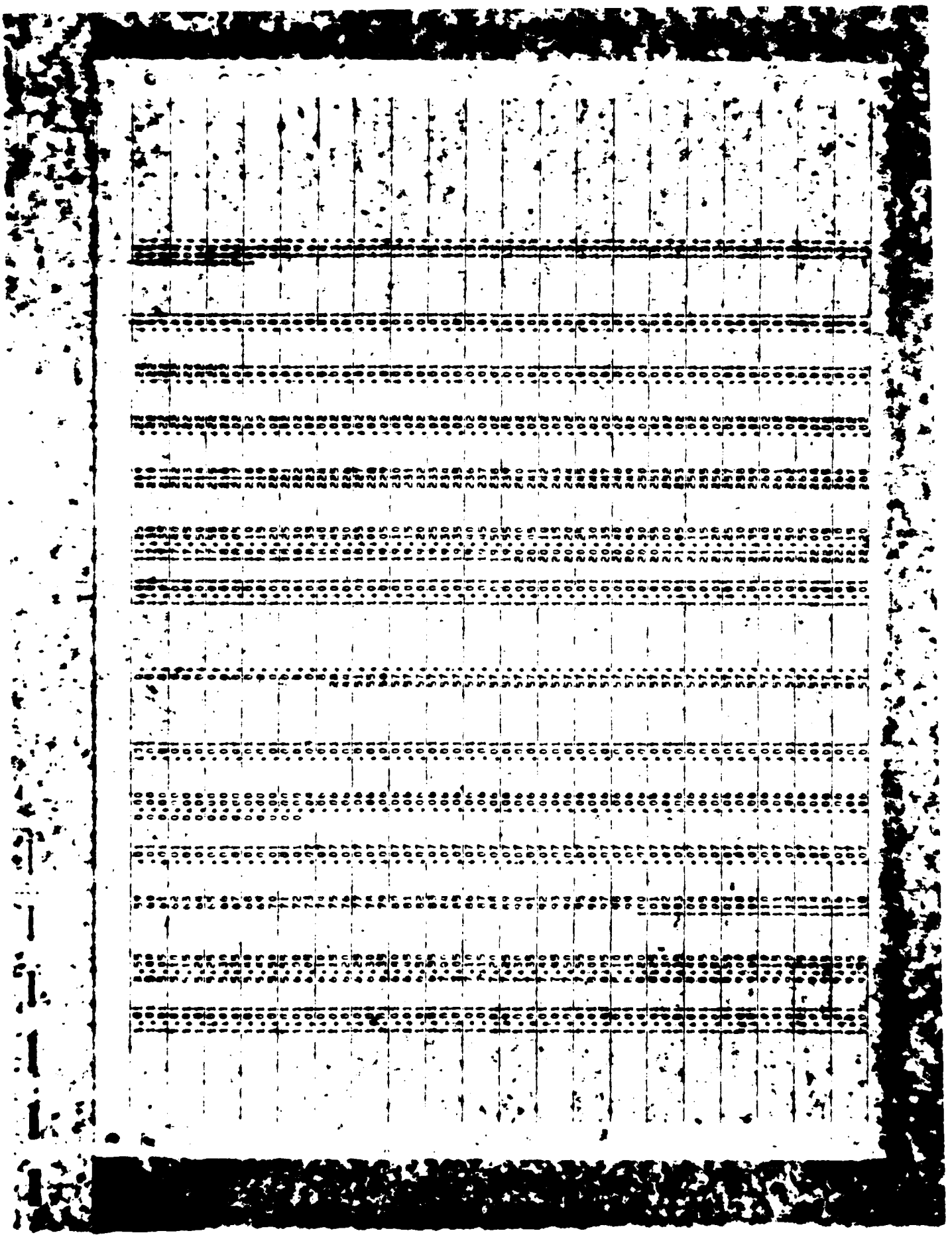
UNIT GRAPH TOTALS 730. CFS OR 1.01 INCHES OVER THE AREA

RECESSION DATA

STRTQ= 0.00 QRCSN= 0.00 RTIOR= 1.00

END-OF-PERIOD FLOW

TW.DA	HR.MN	PERIOD	RAIN.	EXCS	LOSS	COMP.Q	TW.DA	HR.MN	PERIOD	RAIN	EXCS	LOSS	COMP.Q
1.01	.10	1	.01	0.00	.01	0.	1.01	12.10	151	.20	.20	.01	[illegible]
1.01	.15	2	.01	0.00	.01	0.	1.01	12.15	152	.20	.20	.01	104.
1.01	.15	3	.01	0.00	.01	0.	1.01	12.20	153	.20	.20	.01	104.
1.01	.20	4	.01	0.00	.01	0.	1.01	12.25	154	.20	.20	.01	104.
1.01	.25	5	.01	0.00	.01	0.	1.01	12.30	155	.20	.20	.01	104.
1.01	.30	6	.01	0.00	.01	0.	1.01	12.35	156	.20	.20	.01	104.
1.01	.35	7	.01	0.00	.01	0.	1.01	12.40	157	.20	.20	.01	104.
1.01	.40	8	.01	0.00	.01	0.	1.01	12.45	158	.20	.20	.01	104.
1.01	.45	9	.01	0.00	.01	0.	1.01	12.50	159	.20	.20	.01	104.
1.01	.50	10	.01	0.00	.01	0.	1.01	12.55	160	.20	.20	.01	104.
1.01	.55	11	.01	0.00	.01	0.	1.01	13.00	161	.24	.24	.01	104.
1.01	1.00	12	.01	0.00	.01	0.	1.01	13.05	162	.24	.24	.01	104.
1.01	1.05	13	.01	0.00	.01	0.	1.01	13.10	163	.24	.24	.01	104.
1.01	1.10	14	.01	0.00	.01	0.	1.01	13.15	164	.24	.24	.01	104.
1.01	1.15	15	.01	0.00	.01	0.	1.01	13.20	165	.24	.24	.01	104.
1.01	1.20	16	.01	0.00	.01	0.	1.01	13.25	166	.24	.24	.01	104.
1.01	1.25	17	.01	0.00	.01	0.	1.01	13.30	167	.24	.24	.01	104.
1.01	1.30	18	.01	0.00	.01	0.	1.01	13.35	168	.24	.24	.01	104.
1.01	1.35	19	.01	0.00	.01	0.	1.01	13.40	169	.24	.24	.01	104.
1.01	1.40	20	.01	0.00	.01	0.	1.01	13.45	170	.24	.24	.01	104.
1.01	1.45	21	.01	0.00	.01	0.	1.01	13.50	171	.24	.24	.01	104.
1.01	1.50	22	.01	0.00	.01	0.	1.01	13.55	172	.24	.24	.01	104.
1.01	1.55	23	.01	0.00	.01	0.	1.01	14.00	173	.31	.30	.01	104.
1.01	2.00	24	.01	0.00	.01	0.	1.01	14.05	174	.31	.30	.01	104.
1.01	2.05	25	.01	0.00	.01	0.	1.01	14.10	175	.31	.30	.01	104.
1.01	2.10		.01	0.00	.01	0.	1.01	14.15	176	.31	.30	.01	104.
1.01	2.15		.01	0.00	.01	0.	1.01	14.20	177	.31	.30	.01	104.
1.01	2.20		.01	0.00	.01	0.	1.01	14.25	178	.31	.30	.01	104.
1.01	2.25		.01	0.00	.01	0.	1.01	14.30	179	.31	.30	.01	104.
1.01	2.30		.01	0.00	.01	0.	1.01	14.35	180	.31	.30	.01	104.
1.01	2.35	31	.01	0.00	.01	0.	1.01	14.40	181	.31	.30	.01	104.
1.01	2.40	32	.01	0.00	.01	0.	1.01	14.45	182	.31	.30	.01	104.
1.01	2.45	33	.01	0.00	.01	0.	1.01	14.50	183	.31	.30	.01	104.
1.01	2.50	34	.01	0.00	.01	0.	1.01	14.55	184	.31	.30	.01	104.
1.01	2.55	35	.01	0.00	.01	0.	1.01	15.00	185	.31	.30	.01	104.
1.01	3.00	36	.01	0.00	.01	0.	1.01	15.05	186	.19	.18	.01	104.
1.01	3.05	37	.01	0.00	.01	0.	1.01	15.10	187	.37	.36	.01	104.
1.01	3.10	38	.01	0.00	.01	0.	1.01	15.15	188	.37	.36	.01	104.
1.01	3.15	39	.01	0.00	.01	0.	1.01	15.20	189	.56	.55	.01	104.
1.01	3.20	40	.01	0.00	.01	0.	1.01	15.25	190	.65	.64	.01	104.
1.01	3.25	41	.01	0.00	.01	0.	1.01	15.30	191	1.58	1.57	.01	104.
1.01	3.30	42	.01	0.00	.01	0.	1.01	15.35	192	2.60	2.59	.01	132.
1.01	3.35	43	.01	0.00	.01	0.	1.01	15.40	193	1.02	1.01	.01	1330.
1.01	3.40	44	.01	0.00	.01	0.	1.01	15.45	194	.65	.64	.01	1999.
1.01	3.45	45	.01	0.00	.01	0.	1.01	15.50	195	.56	.55	.01	1193.
1.01	3.50	46	.01	0.00	.01	0.	1.01	15.55	196	.37	.36	.01	850.
1.01	3.55	47	.01	0.00	.01	0.	1.01	16.00	197	.37	.36	.01	625.
1.01	4.00	48	.01	0.00	.01	0.	1.01	16.05	198	.28	.28	.01	472.
1.01	4.05	49	.01	0.00	.01	0.	1.01	16.10	199	.28	.28	.01	387.
1.01	4.10	50	.01	0.00	.01	0.	1.01	16.15	200	.28	.28	.01	310.
1.01	4.15	51	.01	0.00	.01	0.	1.01	16.20	201	.28	.28	.01	280.
1.01	4.20	52	.01	0.00	.01	0.	1.01	16.25	202	.28	.28	.01	270.
1.01	4.25	53	.01	0.00	.01	0.	1.01	16.30	203	.28	.28	.01	261.
1.01	4.30	54	.01	0.00	.01	0.	1.01	16.35	204	.28	.28	.01	261.
1.01	4.35	55	.01	0.00	.01	0.	1.01	16.40	205	.28	.28	.01	261.
1.01	4.40	56	.01	0.00	.01	0.	1.01	16.45	206	.28	.28	.01	261.
1.01	4.45	57	.01	0.00	.01	0.	1.01	16.50	207	.28	.28	.01	261.
1.01	4.50	58	.01	0.00	.01	0.	1.01	16.55	208	.28	.28	.01	261.
							1.01	17.00	209	.28	.28	.01	261.
							1.01	17.05	210	.22	.22	.01	261.
							1.01	17.10	211	.22	.22	.01	261.
							1.01	17.15	212	.22	.22	.01	261.
							1.01	17.20	213	.22	.22	.01	261.



1.01	9.55	119	.07	.06	.01	57.	1.01	22.25	269	.02	.01	.01	13.
1.01	10.00	120	.07	.06	.01	57.	1.01	22.30	270	.02	.01	.01	13.
1.01	10.05	121	.07	.06	.01	57.	1.01	22.35	271	.02	.01	.01	13.
1.01	10.10	122	.07	.06	.01	57.	1.01	22.40	272	.02	.01	.01	13.
1.01	10.15	123	.07	.06	.01	57.	1.01	22.45	273	.02	.01	.01	13.
1.01	10.20	124	.07	.06	.01	57.	1.01	22.50	274	.02	.01	.01	13.
1.01	10.25	125	.07	.06	.01	57.	1.01	22.55	275	.02	.01	.01	13.
1.01	10.30	126	.07	.06	.01	57.	1.01	23.00	276	.02	.01	.01	13.
1.01	10.35	127	.07	.06	.01	57.	1.01	23.05	277	.02	.01	.01	13.
1.01	10.40	128	.07	.06	.01	57.	1.01	23.10	278	.02	.01	.01	13.
1.01	10.45	129	.07	.06	.01	57.	1.01	23.15	279	.02	.01	.01	13.
1.01	10.50	130	.07	.06	.01	57.	1.01	23.20	280	.02	.01	.01	13.
1.01	10.55	131	.07	.06	.01	57.	1.01	23.25	281	.02	.01	.01	13.
1.01	11.00	132	.07	.06	.01	57.	1.01	23.30	282	.02	.01	.01	13.
1.01	11.05	133	.07	.06	.01	57.	1.01	23.35	283	.02	.01	.01	13.
1.01	11.10	134	.07	.06	.01	57.	1.01	23.40	284	.02	.01	.01	13.
1.01	11.15	135	.07	.06	.01	57.	1.01	23.45	285	.02	.01	.01	13.
1.01	11.20	136	.07	.06	.01	57.	1.01	23.50	286	.02	.01	.01	13.
1.01	11.25	137	.07	.06	.01	57.	1.01	23.55	287	.02	.01	.01	13.
1.01	11.30	138	.07	.06	.01	57.	1.02	0.00	288	.02	.01	.01	13.
1.01	11.35	139	.07	.06	.01	57.	1.02	.05	289	0.00	0.00	0.00	13.
1.01	11.40	140	.07	.06	.01	57.	1.02	.10	290	0.00	0.00	0.00	10.
1.01	11.45	141	.07	.06	.01	57.	1.02	.15	291	0.00	0.00	0.00	5.
1.01	11.50	142	.07	.06	.01	57.	1.02	.20	292	0.00	0.00	0.00	2.
1.01	11.55	143	.07	.06	.01	57.	1.02	.25	293	0.00	0.00	0.00	1.
1.01	12.00	144	.07	.06	.01	57.	1.02	.30	294	0.00	0.00	0.00	0.
1.01	12.05	145	.20	.20	.01	57.	1.02	.35	295	0.00	0.00	0.00	0.
1.01	12.10	146	.20	.20	.01	86.	1.02	.40	296	0.00	0.00	0.00	0.
1.01	12.15	147	.20	.20	.01	138.	1.02	.45	297	0.00	0.00	0.00	0.
1.01	12.20	148	.20	.20	.01	164.	1.02	.50	298	0.00	0.00	0.00	0.
1.01	12.25	149	.20	.20	.01	176.	1.02	.55	299	0.00	0.00	0.00	0.
1.01	12.30	150	.20	.20	.01	180.	1.02	1.00	300	0.00	0.00	0.00	0.
									SUM	31.72	29.28	2.44	27468.
										(806.)(	744.)(	62.)(	777.68)

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	1599.	309.	95.	92.	27467.
CMS	45.	9.	3.	3.	778.
INCHES		25.98	29.57	29.57	29.57
MM		659.18	751.14	751.14	751.14
AC-FT		153.	189.	189.	189.
THOUS CU M		189.	233.	233.	233.

HYDROGRAPH AT STA 12 FOR PLAN 1, RTIO 1

0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	28.	44.	51.	55.	56.	57.
57.	57.	57.	57.	57.	57.	57.	57.	57.	57.
57.	57.	57.	57.	57.	57.	57.	57.	57.	57.
57.	57.	57.	57.	57.	57.	57.	57.	57.	57.
57.	57.	57.	57.	57.	57.	57.	57.	57.	57.
57.	57.	57.	57.	57.	57.	57.	57.	57.	57.

57.	57.	57.	57.	57.	57.	57.	57.	57.	57.
57.	57.	57.	57.	57.	86.	150.	164.	170.	164.
182.	184.	184.	184.	184.	184.	184.	183.	184.	184.
220.	221.	222.	222.	223.	223.	223.	223.	223.	223.
250.	271.	276.	276.	279.	280.	280.	280.	280.	280.
280.	855.	287.	290.	300.	463.	732.	1330.	1590.	1191.
850.	623.	475.	387.	318.	268.	270.	204.	268.	261.
261.	261.	261.	261.	261.	248.	224.	213.	208.	208.
208.	208.	208.	208.	208.	208.	208.	161.	83.	44.
20.	19.	16.	14.	14.	13.	13.	13.	13.	13.
13.	13.	13.	13.	13.	13.	13.	13.	13.	13.
13.	13.	13.	13.	13.	13.	13.	13.	13.	13.
13.	13.	13.	13.	13.	13.	13.	13.	13.	13.
13.	13.	13.	13.	13.	13.	13.	13.	13.	13.
13.	13.	13.	13.	13.	13.	13.	13.	13.	13.
13.	13.	13.	13.	13.	13.	13.	13.	13.	13.
5.	2.	1.	0.	0.	0.	0.	0.	0.	0.

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	1599.	309.	95.	92.	27467.
CMS	45.	9.	3.	3.	778.
INCHES		23.98	29.57	29.57	29.57
MM		609.18	751.14	751.14	751.18
AC-FT		153.	189.	189.	189.
THOUS CU M		189.	233.	233.	233.

HYDROGRAPH AT STA 12 FOR PLAN 1, RTIO 2

0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	4.	14.	22.	26.	27.	28.	28.
29.	29.	29.	29.	29.	29.	29.	29.	29.	29.
29.	29.	29.	29.	29.	29.	29.	29.	29.	29.
29.	29.	29.	29.	29.	29.	29.	29.	29.	29.
29.	29.	29.	29.	29.	29.	29.	29.	29.	29.
29.	29.	29.	29.	29.	29.	29.	29.	29.	29.
29.	29.	29.	29.	29.	29.	29.	29.	29.	29.
29.	29.	29.	29.	29.	29.	29.	29.	29.	29.
29.	29.	29.	29.	29.	83.	69.	82.	88.	90.
91.	92.	92.	92.	92.	92.	92.	96.	104.	108.
110.	111.	111.	111.	111.	111.	111.	111.	111.	110.
129.	135.	138.	139.	139.	140.	140.	140.	140.	140.
140.	187.	199.	148.	180.	231.	366.	669.	799.	906.
425.	311.	236.	193.	159.	142.	135.	132.	131.	131.
130.	130.	130.	130.	130.	124.	112.	108.	104.	103.
102.	102.	102.	102.	102.	102.	102.	81	81.	82.
13.	10.	8.	7.	7.	6.	6.	6.	6.	6.
6.	6.	6.	6.	6.	6.	6.	6.	6.	6.
6.	6.	6.	6.	6.	6.	6.	6.	6.	6.
6.	6.	6.	6.	6.	6.	6.	6.	6.	6.
6.	6.	6.	6.	6.	6.	6.	6.	6.	6.
6.	6.	6.	6.	6.	6.	6.	6.	6.	6.
6.	6.	6.	6.	6.	6.	6.	6.	6.	5.
2.	1.	0.	0.	0.	0.	0.	0.	0.	0.

COMBINED UPSTREAM ROUTED HYDROGRAPH

WITH DOWNSTREAM LOCAL HYDROGRAPH

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	700.	1109.	[illegible]	40.	13733.
CMS	20.	8.	1.	1.	389.
INCHES		11.09	16.19	14.79	14.79
MM		304.59	379.57	375.57	379.57
AC-FT		72.	99.	95.	95.
THOUS CU M.		90.	117.	117.	117.

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COMBINE HYDROGRAPHS

ADD UPSTREAM FLOWS TO DOWNSTREAM HYDROGRAPH

ISTAQ	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME	ISTAGE	IAUTO
12	2	0	0	0	0	1	0.	0

SUM OF 2 HYDROGRAPHS AT 12 PLAN 1 RTIO 1

0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	28.	45.	54.	61.	69.	80.
99.	123.	167.	216.	249.	335.	412.	486.	559.	630.
702.	766.	822.	871.	914.	951.	983.	1011.	1036.	1057.
1075.	1095.	1112.	1125.	1135.	1144.	1151.	1157.	1161.	1165.
1169.	1171.	1174.	1175.	1177.	1178.	1179.	1180.	1180.	1181.
1181.	1181.	1181.	1181.	1181.	1181.	1182.	1182.	1182.	1182.
1182.	1182.	1182.	1182.	1182.	1182.	1182.	1182.	1182.	1182.
1182.	1182.	1182.	1182.	1182.	1210.	1266.	1301.	1334.	1370.
1404.	1535.	1651.	1790.	1955.	2146.	2332.	2518.	2698.	2906.
3204.	3350.	3473.	3584.	3699.	3805.	3906.	4000.	4085.	4172.
4264.	4341.	4412.	4488.	4573.	4667.	4769.	4877.	4984.	5088.
5184.	5244.	5307.	5412.	5528.	5676.	6052.	6885.	7601.	7940.
8647.	9745.	10797.	11840.	12756.	13302.	13619.	13469.	12988.	12384.
11583.	10734.	10017.	9298.	8678.	8188.	7716.	7330.	6997.	6701.
6425.	6167.	5933.	5709.	5496.	5332.	5179.	4990.	4778.	4606.
4442.	4258.	4020.	3740.	3436.	3102.	2760.	2480.	2310.	2122.
1920.	1723.	1564.	1413.	1272.	1143.	1028.	958.	875.	806.
742.	683.	630.	583.	540.	509.	481.	456.	434.	414.
395.	379.	364.	350.	339.	328.	319.	310.	302.	297.
292.	287.	284.	281.	278.	276.	274.	272.	271.	270.
269.	268.	268.	267.	267.	266.	266.	266.	265.	265.
265.	265.	265.	265.	265.	265.	265.	265.	264.	262.
256.	253.	250.	247.	243.	238.	232.	224.	215.	206.

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	13619.	6176.	1956.	1878.	503402.
CMS	386.	175.	55.	53.	15956.
INCHES		43.17	29.35	29.35	29.35
MM		588.41	745.52	745.52	745.52
AC-FT		3062.	3880.	3880.	3880.
THOUS CU M		3777.	4786.	4786.	4786.

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                             SUM OF 2 HYDROGRAPHS AT      12  PLAN 1  RTIO 2
        0.         0.         0.         0.         0.         0.         0.         0.         0.         0.
        0.         0.         0.         0.         0.         0.         0.         0.         0.         0.
        0.         0.         0.         0.         0.         0.         0.         0.         0.         0.
        0.         0.         0.         0.         0.         0.         0.         0.         0.         0.
        0.         0.         0.         0.         0.         0.         0.         0.         0.         0.
        0.         0.         0.         0.         0.         0.         0.         0.         0.         0.
        0.         0.         0.         0.         0.         0.         0.         0.         0.         0.
        0.         0.         0.         0.        14.        22.        27.        31.        35.        40.
       48.        57.        64.        87.       116.       146.       176.       206.       235.       263.
      297.       331.       362.       389.       414.       436.       455.       472.       487.       501.
      512.       523.       532.       540.       546.       553.       560.       565.       569.       573.
      576.       579.       581.       583.       585.       586.       587.       588.       588.       589.
      589.       589.       590.       590.       590.       590.       590.       590.       591.       591.
      591.       591.       591.       591.       591.       591.       591.       591.       591.       591.
      591.       591.       591.       591.       591.       605.       632.       649.       663.       681.
      708.       745.       794.       853.       920.       994.      1070.      1162.      1266.      1357.
     1437.      1511.      1579.      1644.      1706.      1766.      1824.      1886.      1941.      1996.
     2092.      2098.      2138.      2178.      2219.      2262.      2309.      2358.      2408.      2459.
     2508.      2542.      2580.      2640.      2714.      2822.      3009.      3408.      3732.      4053.
     4152.      4687.      5236.      5947.      6491.      6780.      6848.      6725.      6480.      6069.
     5603.      5289.      5011.      4720.      4441.      4182.      3946.      3742.      3568.      3412.
     3269.      3136.      3013.      2899.      2790.      2689.      2610.      2548.      2461.      2388.
     2318.      2242.      2150.      2042.      1917.      1777.      1638.      1502.      1363.      1226.
     1096.       988.       903.       821.       745.       674.       610.       551.       504.       466.
      430.       397.       367.       340.       315.       293.       273.       255.       242.       232.
      223.       214.       206.       198.       191.       185.       179.       174.       169.       165.
      161.       158.       155.       152.       150.       148.       146.       145.       143.       142.
      141.       140.       139.       138.       137.       137.       136.       136.       135.       135.
      135.       134.       134.       134.       134.       134.       133.       133.       133.       132.
      129.       127.       126.       125.       123.       120.       117.       113.       108.       103.

                                 PEAK   6-HOUR   24-HOUR   72-HOUR   TOTAL VOLUME
                        CFS     6848.    3076.      977.      938.       281517.
                        CMS      194.      87.       28.       27.         7972.
                     INCHES              11.58     14.67     14.67        14.67
                         MM             293.04    372.52    372.52       372.52
                      AC-FT              1525.     1939.     1939.        1939.
                THOUS CU M               1881.     2391.     2391.        2391.




     **********         **********         **********         **********         **********

                                   HYDROGRAPH ROUTING

                  ROUTE COMBINED HYDROGRAPHS THROUGH OLD PERRY CITY DAM A
                            ISTAQ   ICOMP   IECON   ITAPE    JPLT    JPRT   INAME  ISTAGE   IAUTO
                               12       1       0       0       2       0       1       0       0
                                                ROUTING DATA
                     QLOSS   CLOSS     AVG   IRES   ISAME    IOPT    IPMP            LSTR
                       0.0   0.000    1.00      1       0       0       0               0

                            NSTPS   NSTDL     LAG   AMSKK       X     TSK   STORA  ISPRAT
```

SUMMARY OF PMF AND ONE-HALF PMF FLOOD ROUTING

AND

DAM SAFETY ANALYSIS

PEAK FLOW AND STORAGE (END OF PERIOD) SUMMARY FOR MULTIPLE PLAN-RATIO ECONOMIC COMPUTATIONS
FLOWS IN CUBIC FEET PER SECOND (CUBIC METERS PER SECOND)
AREA IN SQUARE MILES (SQUARE KILOMETERS)

OPERATION	STATION	AREA	PLAN	RATIOS APPLIED TO FLOWS RATIO 1 1.00	RATIO 2 .50
HYDROGRAPH AT	12	2.36 (6.11)	1	13521. (382.86)(	6761. 191.44)(
ROUTED TO	12	2.36 (6.11)	1	13349. (378.01)(	6713. 190.08)(
HYDROGRAPH AT	12	.12 (.31)	1	1599. (45.27)(	799. 22.63)(
2 COMBINED	12	2.48 (6.42)	1	13619. (385.66)(	6848. 193.90)(
ROUTED TO	12	2.48 (6.42)	1	13505. (382.42)(	6627. 187.68)(

SUMMARY OF DAM SAFETY ANALYSIS

PLAN 1 .....

	INITIAL VALUE	SPILLWAY CREST	TOP OF DAM
ELEVATION	682.50	682.50	688.00
STORAGE	35.	35.	109.
OUTFLOW	0.	0.	2516.

RATIO OF PMF	MAXIMUM RESERVOIR W.S.ELEV	MAXIMUM DEPTH OVER DAM	MAXIMUM STORAGE AC-FT	MAXIMUM OUTFLOW CFS	DURATION OVER TOP HOURS	TIME OF MAX OUTFLOW HOURS	TIME OF FAILURE HOURS
1.00	690.66	2.66	172.	13349.	5.67	16.42	0.00
.50	689.35	1.35	135.	6713.	2.67	16.42	0.00

SUMMARY OF DAM SAFETY ANALYSIS

PLAN 1 .....

	INITIAL VALUE	SPILLWAY CREST	TOP OF DAM
ELEVATION	676.40	676.40	683.00
STORAGE	61.	61.	191.
OUTFLOW	0.	0.	5000.

RATIO OF PMF	MAXIMUM RESERVOIR W.S.ELEV	MAXIMUM DEPTH OVER DAM	MAXIMUM STORAGE AC-FT	MAXIMUM OUTFLOW CFS	DURATION OVER TOP HOURS	TIME OF MAX OUTFLOW HOURS	TIME OF FAILURE HOURS
1.00	684.55	1.55	241.	13509.	2.67	16.50	0.00
.50	683.38	.38	203.	6627.	.67	16.50	0.00